Ballona Creek Terminus: Historical Evidence of Terminal Lagoon Conditions, 1815–Present

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Executive Summary

This report evaluates primary cartographic and documentary evidence bearing on the historic hydraulic character of the Ballona Creek terminus. The evidence demonstrates that during the historical baseline period relevant to restoration planning, Ballona functioned as an independent terminal lagoon fed by its local watershed, not as a persistently open tidal estuary. Restoration planning documents for the Ballona Wetlands ground their historical characterization in two sources: Dark et al., *Historical Ecology of the Ballona Creek Watershed*, SCCWRP Technical Report No. 671 [5], and Grossinger et al. (2011), *Historical Wetlands of the Southern California Coast: An Atlas of U.S. Coast Survey T-Sheets, 1851–1889* [13]. [14][15] Neither source explicitly establishes permanent, sustained tidal connection as the historical condition at the Ballona terminus. This report demonstrates that two earlier, jurisdictionally operative land surveys — the Hancock federal survey (1857–1858) and the Courtney court-certified partition map (1867–1868) — document the terminus as an intermittently closed coastal lagoon rather than a persistently open tidal estuary, and that those records do not appear to have been incorporated into the planning baseline analysis.

Finding 1 — Federal survey evidence: The earliest official government survey of Rancho La Ballona (Henry Hancock, 1857–1858) characterizes the terminus as an "interior lake" whose "connection with the sea is often obstructed." [1:Vol.199,p.310] Measured inlet dimensions of 5–6 feet wide and a documented lagoon extent of approximately 1.6 miles inland are consistent with an intermittently closed coastal lagoon, not a permanent river outlet. These observations, made approximately 32–33 years after the 1825 LA River avulsion, are fundamentally inconsistent with sustained river-mouth conditions under standard fluvial geomorphology (see Section 5.3 for full analysis). [1:Vol.199,pp.303-307][9]

Finding 2 — Court-certified land classification: The 1867–1868 Courtney Partition Map (District Court Case No. 965), based explicitly on Hancock's survey, classified only a narrow coastal fringe as fourth-class "Lands in Bay." Interior lands were designated first-class irrigable or second-class dry farming property—confirming limited tidal penetration and a productive agricultural interior wholly inconsistent with estuarine conditions.

Finding 3 — Historical accounts and convergent evidence: First-hand testimony (Warner, 1876; Guinn, 1915) documents that during the Spanish Colonial period the LA River's predominant course ran southward through the Dominguez Gap to San Pedro Bay, and that the 1815–1825 avulsion toward Ballona was a temporary anomaly. A seven-category convergent evidence analysis further demonstrates that the 1825 flood restored rather than created that predominant southward route, with episodic departures documented in Holocene reconstructions. [3][4][16][21][24:pp.11,80]

Finding 4 — Independent spring-fed hydrology: During the documented Spanish Colonial period and after 1825, the Ballona watershed was sustained by 45 mapped freshwater springs with an estimated combined discharge of 2–5 million gallons per day, independent of the LA River's predominant southward course during the documented Spanish Colonial period immediately preceding 1815, with earlier geological episodes outside the scope of this report. This spring system, not river discharge, sustained the Ballona wetland complex after 1825. Today, 96–98% of that spring discharge has been lost to groundwater overdraft relative to late-19th-century documented discharge levels, a primary disturbance that restoration planning must account for. [17][18]

Finding 5 — Pattern of source omission: Modern restoration planning has relied primarily on the 1876 T-Sheet (NOAA T-Sheet No. 1432b), while earlier federal-era survey records — including the 1858 Hancock Survey and the 1868 "Lands in Bay" partition materials (Courtney) — are not reflected in the baseline documentation reviewed in the administrative record. These records carry chronological precedence and federal survey authority that gives them significant evidentiary weight in reconstructing historical hydrology. The May 2023 Los Angeles County Superior Court ruling and September 2023 EIR decertification demonstrate that deficiencies in evidentiary support can materially affect CEQA compliance and project approval. The 2026 Revised EIR presents an opportunity to establish a defensible environmental baseline grounded explicitly in the earliest available primary-source documentation. (See Section 7.2 for full analysis.) [5][13][14][15][19]

Hyperlink Verification Note: All hyperlinks in this report were verified live as of the report date; targets and availability may change without notice.

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1. Introduction

1.1 Purpose and Scope

Contemporary restoration planning documents for the Ballona Wetlands frequently assert or assume that Ballona Creek historically served as the outlet channel for the Los Angeles River into Santa Monica Bay. [5][14][15] This assumption has significant implications for restoration design, hydrological modeling, and ecological baseline definitions.

This report examines primary historical evidence, especially the Hancock and Courtney official government surveys, to answer:

1. Did Ballona Creek function as a permanent outlet for the Los Angeles River prior to Anglo-American development?
2. What was the hydrological character of the Ballona terminus—open river mouth or intermittently closed lagoon?

This report does not assert that restoration must return to 1857 conditions; it asserts only that the administrative record does not document historical support within the stated 1850–1890 reference period for permanent full tidal connection.

1.2 Methods

Sources used:

- Official U.S. Government land survey records (Hancock 1857–1858). [1:Vol.199,pp.298-314]
- Official court-certified rancho partition mapping (Courtney Map, District Court Case No. 965, 1867–1868).
- First-hand accounts from early California residents (Warner, Hayes, Guinn). [3][4]
- Los Angeles County Flood Control Engineer primary-source flood chronology compilation (Reagan 1917). [24]
- Historical ecology studies. [5][13]
- Independent academic historical hydrology study (Gumprecht 1999). [21]
- Geological and hydrological analyses. [5][6][7][9]
- Comparative analysis of California terminal lagoon systems. [5][6][7]
- Multi-category convergent evidence analysis for pre-1815 LA River hydrology. [16]
- Freshwater spring hydrology and historical flow rate documentation. [17][18]
- Logical consistency analysis of CDFW historical baseline methodology. [19]

Primary, contemporaneous documents are given more weight than later secondary interpretations.

Note on McMahon (2026) reports [16–19]: The author's prior reports cited as References [16–19] are integrative analyses of primary and secondary sources that are independently accessible in the public record. These reports are cited only where the underlying primary sources are also cited directly in this report. No finding in this report rests solely on the author's prior work.

Document Accessibility: The Hancock Field Notes, Hancock Plat, and Courtney Partition Map analyzed in this report are publicly accessible via Internet Archive (see References [1], [2], and [10] for direct URLs). These are not obscure documents but official U.S. Government and court records that have been preserved and digitized for public access.

1.2.1 Evidentiary Weighting Framework

This report applies a hierarchy of evidentiary weight:

1. **Sworn federal survey records with certified approval and public notice** — Hancock Field Notes and Plat (1857–1872) [1][2]

2. **Court-ordered, fiduciary land classification documents** — Courtney Partition Map (1867–1868) [10]
3. **First-hand historical testimony recorded contemporaneously** — Warner, Hayes, Guinn [3][4]; Reagan (1917) compiled eyewitness accounts [24]
4. **Multi-category convergent evidence analyses** — McMahon [16][17][18][19]
5. **Later historical ecology analyses** — Dark et al. (2011) [5]; Gumprecht (1999) [21]
6. **Modern interpretive planning documents** — T-Sheet 1432b [13]; CDFW EIR [14][15]

Where discrepancies arise between sources, greater weight is assigned to earlier sworn primary documentation created under federal authority and subject to public inspection. This hierarchy is not a judgment about the competence of later sources but a standard principle of primary source analysis: earlier, sworn, publicly-noticed government records carry greater evidentiary weight than later interpretive summaries. The primacy of original federal survey records is grounded in the Federal Public Land Survey System statutory framework (43 U.S.C. § 751 et seq.) and the BLM Manual of Surveying Instructions, under which original survey field notes and plats constitute the controlling legal record for land boundary determination. This evidentiary hierarchy applies specifically to physical hydraulic description and historical channel configuration; it does not preclude use of later sources for ecological inference where earlier documentation is silent.

1.2.2 Analytical Framework

This report develops its analysis in four steps:

- **Step 1 — Physical evidence:** Primary federal survey evidence (Hancock, 1857–58) documents a small, intermittently closed terminal lagoon with a 5–6 foot inlet—not a river mouth. (Section 2)
- **Step 2 — Legal-economic encoding:** Court-certified land classification (Courtney, 1867–68) independently encodes the same hydrologic reality: "Lands in Bay" confined to a narrow coastal fringe, interior lands classified as high-value agricultural property. (Section 3)
- **Step 3 — Historical and geological context:** First-hand accounts and convergent multi-category evidence establish the LA River's long-term southward course and confirm the 1815–1825 Ballona connection as a short-lived anomaly. Holocene paleoenvironmental reconstructions (Altschul et al. 2007) are acknowledged but bounded to long geological timescales, not the restoration planning baseline period (1857–68). (Section 4, Section 5, Section 6)
- **Step 4 — Source hierarchy and planning implications:** Modern planning has relied on later, lower-authority evidence over these earlier, higher-authority sources—a methodological pattern consistent with the flood capacity discrepancy documented in the administrative record. (Section 7, Section 8, Section 9, Section 10)

1.3 Hydrologic Periods

Understanding Ballona requires distinguishing three periods: [3][5][16]

- **Pre-1815**: Documented Spanish Colonial period condition — the LA River's predominant established course ran southward through the Dominguez Gap to San Pedro Bay; Ballona Creek functioned as an independent local watershed during this period. Pre-1815 geological behavior, including Holocene episodes in which the predecessor river episodically reached the Ballona area, does not alter the documented Spanish Colonial period condition that is the focus of this report. [3][4][16][20][21][24:pp.80,85,97]
- **1815–1825**: Debris-dam anomaly spanning the late Spanish Colonial and early Mexican periods — temporary westward avulsion toward Ballona; the 1825 flood, occurring during the Mexican period, restored rather than created the predominant southward San Pedro route [16][21][24:pp.11,80,240]
- **Post-1825**: LA River re-established southward course to San Pedro Bay; Ballona Creek functions as independent local watershed with a small watershed-sustained terminal lagoon [16][17][18]

Note on baseline terminology: this report distinguishes between the regulatory baseline period used in agency planning documents (1850–1890, per Dark et al. 2011 as cited in the EIS/EIR) and the documented historical baseline established by the earliest primary sources (1857–68, Hancock and Courtney). Where the two differ, this report assigns priority to the earlier sworn federal documentation per the Evidentiary Weighting Framework (Section 1.2.1).

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2. Hancock Survey (1857–1858)

2.1 Authority and Legal Chain

In 1857–1858, U.S. Deputy Surveyor Henry Hancock surveyed Rancho La Ballona for the federal land claims process. [1:Vol.199,p.298] The survey:

- Was ordered by John G. Hayes, U.S. Surveyor General of the Public Lands
- Included field notes with instructions dated April 17, 1857
- Commenced July 14, 1858
- Was completed July 19, 1858
- Field notes were sworn before K.H. Dimmick, Notary Public, July 1858 [1:Vol.199,p.299]
- Was verified by Theo. Wagner, U.S. Surveyor-General for California, February 17, 1863 [1:Vol.199,p.314]

This was an official U.S. Government survey with sworn testimony and multiple levels of verification—not casual observation.

The survey produced both detailed field notes (Vol. 199, pp. 298–314) and an official plat (map) showing the rancho boundaries, water features, and land character. The plat, approved by U.S. Surveyor General J.W. Mandeville in September 1858, visually depicts the terminal lagoon as

an "Inner Bay" with "Obstructed Connection" to the sea—cartographic representation of the "interior lake" characterization in the field notes. In accordance with the Act of Congress of July 1, 1864, this plat was published in the *San Francisco Times* (starting March 6, 1869) and *Los Angeles Republican* (starting March 11, 1869) for four weeks each, with a 90-day public inspection period. No protests challenging the hydrological characterization are documented. The plat was certified as accurate by U.S. Surveyor General J.R. Hardenbergh in November 1872.

2.2 "An Interior Lake" — Hancock's Hydrological Assessment

Hancock's most significant hydrological observation appears in the REMARKS section of his field notes [1:Vol.199,p.310]:

> "The inlet bay may very properly **be styled, an interior lake**, for as previously stated, in the foregoing notes, **the connection with the sea is often obstructed.**"

This explicit categorization as an "interior lake" is unambiguous. Hancock observed that inlet closure occurred with sufficient frequency that the water body functioned as an interior lake rather than an open bay.

Hydrologic implications:

1. **Frequent inlet closure**: The connection with the sea was "often obstructed," not occasionally or rarely
2. **Interior lake hydrology**: Hancock specifically rejected "bay" characterization in favor of "interior lake"
3. **Small inlet dimensions**: Field notes document inlet width of only 8–10 links (5.3–6.6 feet) and length of 130 links (85.8 feet) at Station 23 [1:Vol.199,p.305]—consistent with intermittently closed lagoon, not river mouth
4. **Limited inland extent**: The "bay" (lagoon) had its "northmost terminus at a distance of about 130 chains" [1:Vol.199,p.307]—approximately 2,640 meters or 1.64 miles—defining a small terminal lagoon, not extensive tidal estuary
5. **Ephemeral water bodies**: Hancock documented "a dry bed of a lake 10 chains from east to west and about 3, from north to south" [1:Vol.199,p.308] (approximately 660 feet east-west by 198 feet north-south), evidence of seasonal flooding and evaporation characteristic of terminal lagoon systems
6. **Creek discharge point**: "At about 100 chains the Ballona Creek discharges itself into the bay" [1:Vol.199,p.303]—approximately 6,600 feet (1.25 miles) from the inlet, establishing that Ballona Creek discharged into a terminal lagoon, not directly to ocean

Inlet measurement methodology:

Hancock specifically noted the care taken to measure the inlet [1:Vol.199,pp.305-306]:

> "In order to ascertain the distance across the inlet I traversed and tabled for it, and found for course and distance."

This deliberate measurement indicates the inlet was a small, variable feature requiring special attention—not a large, obvious river mouth.

Hancock's measurement represents a contemporaneous observation, not a continuous hydrographic record. However, combined with the inlet obstruction frequency he documented and the land classification patterns encoded nine years later in the Courtney partition map, it indicates a stable morphological regime rather than a transient anomaly.

The next section tests whether the land market and court-ordered partition map reflect the same small, terminal-lagoon hydrology that Hancock observed.

2.3 Survey Personnel and Authority

The field notes document the survey team [1:Vol.199,pp.299-300]:

Henry Hancock, Deputy Surveyor — Principal surveyor under orders from U.S. Surveyor General

Survey Team:

- Ebenezer Hadley — Compassman
- John Warren — Chairman
- Benjamin Virgin — Chairman
- Ramon Mendibil — Axeman

Legal Authority:

Field notes were sworn and attested before K.H. Dimmick, Notary Public, on July 1858. [1:Vol.199,p.299]

The survey was later verified by Theo. Wagner, U.S. Surveyor-General for California, on February 17, 1863 [1:Vol.199,p.314]:

> "I hereby certify that the foregoing transcript has been correctly copied from the original field-notes as the same appear of record and on file in this office."

This multi-layered official authority—sworn testimony by survey team, notary attestation, and federal Surveyor-General verification—establishes these observations as official U.S. Government records, not casual descriptions.

2.4 Why Omission of the Hancock Survey Constitutes an Oversight in CEQA Baseline Analysis

The Hancock Field Notes and Hancock Plat are not obscure or difficult to locate documents. They are the chronologically earliest, highest-authority federal survey of Rancho La Ballona in existence. They carry sworn testimony under oath before a notary public, approval by the U.S. Surveyor General within two months of field completion, public newspaper advertisement in two major California newspapers for four consecutive weeks, a formal 90-day public inspection period with no documented protests, and a certified copy by a subsequent U.S. Surveyor General fourteen years after original survey. The documents are publicly accessible via the BLM General Land Office Records database (https://glorecords.blm.gov) — a federal government resource — and have been archived on Internet Archive since March 18, 2024.

For CEQA purposes, a "defensible environmental baseline" requires that agencies analyze the best available evidence in establishing historical conditions. The Evidentiary Weighting Framework established in Section 1.2.1 of this report reflects standard primary-source principles: sworn federal survey records with certified approval and formal public notice outweigh later interpretive analyses for physical hydraulic description. The CDFW EIR and EIS/EIR rely primarily on the 1876 T-Sheet (NOAA T-Sheet No. 1432b) and the 2011 Dark et al. SCCWRP Technical Report No. 671. Both are 18 or more years later than the Hancock survey, neither carries sworn testimony, and neither is a federal land disposition record. Neither document addresses, analyzes, or cites Hancock's "interior lake" characterization or his precisely measured 5–6 foot inlet width.

The omission is an oversight in CEQA baseline analysis for a specific and documentable reason: the administrative record of the CDFW EIR does not reflect that agency staff analyzed the Hancock Field Notes (Vol. 199, pp. 298–314), the Hancock Plat (July 1858), or the plat's 1869 public notice period and 90-day inspection record. Because those documents are materially inconsistent with the premise of persistent tidal connection underlying Alternative 1 (Full Tidal Restoration/Proposed Action) — Hancock describes an inlet that is "often obstructed" and a water body that "may very properly be styled an interior lake" — their omission from the baseline analysis means the preferred alternative is grounded in a historical narrative that the agency's own highest-authority source, had it been consulted, would have challenged.

The methodological parallel to the flood capacity issue is direct. In both cases, a higher-authority federal source (1979 USACE for flood capacity; 1858 Hancock for historical baseline) was present in the public record, was not reflected in the EIR baseline analysis, and the absence produced specifications inconsistent with what the authoritative source actually documented. The May 2023 court ruling and September 2023 EIR decertification established the legal consequences of the first omission. The Revised EIR preparation (2026) is the opportunity to address the second.

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3. Courtney Partition Map (1867–1868)

Where Hancock describes the water, Courtney describes the land market's response to that water.

3.1 Context

The Courtney partition map was created under Los Angeles District Court order (Case No. 965) to divide Rancho La Ballona among multiple owners. The map, certified in May 1868, shows parcel boundaries and a four-class land classification system.

The physical case file for District Court Case No. 965 is held in the Los Angeles Area Court Records (LAACR) at The Huntington Library, San Marino, California; see Reference [10] for full access details, digitization links, and a note on the map's naming convention.

3.2 Four-Class Land System

The Courtney Map uses four land classes:

1. **First-class**: "Irrigable" lands—best agricultural land
2. **Second-class**: Dry farming lands—good but not irrigable
3. **Third-class**: "Swamp or in Bay" and pasture lands—marginal agricultural value
4. **Fourth-class**: "Lands in Bay"—tidal lands and beach (lowest value)

3.3 "Lands in Bay" Distribution

The fourth-class "Lands in Bay" designation is confined to a narrow coastal fringe. Interior parcels are classified as first-class (irrigable) and second-class (dry farming) lands—productive agricultural property, not tidal lands.

This classification system, created only 43 years after the 1825 LA River avulsion and 9 years after the Hancock survey, provides official documentation of which lands were considered "bay" (tidal) versus agricultural. The limited extent of fourth-class lands is consistent with Hancock's documentation of a small terminal lagoon, not an extensive river-mouth estuary.

3.4 Title Block and Survey Basis

The Courtney Map title block explicitly references Hancock's survey as its boundary basis:

> "Map of the Rancho 'La Ballona'... containing 13919.97 acres of Land according to a Survey made under instructions from the U.S. Surveyor General by Henry Hancock, Dep. Sur. in July, 1858."

This direct citation creates a documentary chain: Hancock's field observations (1857–58) → Courtney's official land classification (1867–68).

The three referees who conducted the partition were J.J. Warner, H. Thomas, and E.H. Boyd, appointed by court order dated December 14, 1867. J.J. Warner was himself one of the primary early California sources documenting LA River hydrology. [3]

3.5 Hancock–Courtney Consistency Analysis

The consistency between Hancock's field observations, Hancock's plat depiction, and Courtney's land classifications is significant. The Courtney referees had access to both Hancock's field notes and his approved plat showing "Inner Bay" and "Obstructed Connection" when conducting their land classification. This multi-source consistency strengthens the evidentiary foundation:

Hancock Field Notes (1857–58)	**Courtney Map (1867–68)**	**Consistency**
"Interior lake" characterization [1:Vol.199,p.310]	Fourth-class "Lands in Bay" limited to coastal fringe	Terminal lagoon with limited tidal extent
Inlet 5–6 feet wide [1:Vol.199,p.305]	No major inlet feature shown on partition map	Small, variable inlet—not major river outlet
Lagoon terminus ~130 chains (1.6 mi) inland [1:Vol.199,p.307]	Fourth-class bay lands confined to narrow coastal zone	Limited inland penetration of tidal influence
Creek discharges into bay ~1.25 mi from inlet [1:Vol.199,p.303]	Interior lands classified as high-value agricultural	Interior not affected by estuarine conditions
Southern portion "strong first rate soil," "most part irrigable" [1:Vol.199,p.311]	Interior parcels allocated as first-class (irrigable) land	Productive agricultural core, not tidal marsh

Both documents consistently describe a **small terminal lagoon with limited tidal extent**, not an open river mouth with extensive estuarine penetration into interior areas. [1:Vol.199,p.310]

Having shown that both federal survey and court partition encode a small terminal lagoon, we next examine first-hand historical testimony and convergent geological evidence to establish the LA River's long-term hydrological context.

3.6 Evidentiary Significance of the Partition Proceeding — Absence of Recorded Objection by Landowners with Direct Knowledge

The Courtney Partition Map is not a casual cartographic exercise. District Court Case No. 965 was a formal adversarial legal proceeding to partition Rancho La Ballona — a 13,919-acre

Mexican land grant — among multiple competing claimants following the U.S. land confirmation process. The court appointed three referees (J.J. Warner, H. Thomas, and E.H. Boyd) by order dated December 14, 1867, each with fiduciary obligations to both the court and the claimants. The referees' function was to equitably divide the rancho's value as well as its acreage. To accomplish this, they were required to classify the land accurately, because the four-class system reflected real differences in economic value: first-class irrigable land was worth substantially more per acre than fourth-class bay land. Any misclassification would expose the referees to challenge and the partition to legal attack from any owner who received less than their fair share.

The Table of Partitions — the tabular portion of the Courtney Map that assigns specific acreages in each land class to each named claimant — was a court-published legal document. Under California court practice in the post-Statehood era, partition proceedings required notice to all interested parties, an opportunity to inspect the partition, and the right to object to the referee's findings before the court confirmed the partition. The claimants in Case No. 965 were not strangers to the land. These were rancho families and their successors who had grazed cattle over this terrain for decades, who knew where the wetlands were, where the bay waters reached, and where the ground was firm agricultural soil. They had every economic incentive to object if the fourth-class "Lands in Bay" classification was understated — meaning they were assigned tidal land that was actually farmable — or overstated — meaning their neighbor received irrigable land classified at bay-land rates.

No documented objection to the fourth-class "Lands in Bay" classification appears in the partition record. The absence of recorded objection during a formal adversarial proceeding — in which landowners had notice, fiduciary oversight, and direct economic incentive to challenge any misclassification — provides strong corroborative evidence that the mapped tidal extent reflected conditions that the people with the deepest first-hand knowledge of the property accepted as accurate. This is independent corroboration of Hancock's "interior lake" assessment from a source entirely different in character: not a government surveyor conducting a federal land survey, but the property owners themselves, with decades of lived experience on the land, operating under the formal accountability of a 19th-century California district court proceeding.

Why omission of the Courtney Map and Table of Partitions constitutes an oversight in CEQA baseline analysis:

The CDFW EIR and EIS/EIR do not appear to cite, analyze, or address the Courtney Partition Map (District Court Case No. 965), its four-class land system, its Table of Partitions, or the evidentiary significance of the partition proceeding's notice and objection record. This is an oversight for reasons parallel to — but legally distinct from — the Hancock omission.

The Hancock Survey tells us what a trained federal surveyor measured and observed in 1857–58. The Courtney Map tells us something different and complementary: what a California court, acting on the sworn duty of court-appointed referees with fiduciary obligations, officially

classified as "bay" land in 1868, and what the property owners themselves — with decades of direct knowledge of the terrain — accepted without objection in a formal legal proceeding. The Courtney Map is therefore court-certified, landowner-corroborated evidence of the spatial extent of tidal influence at Ballona as of 1868, forty-three years after the 1825 LA River avulsion.

If the CDFW EIS/EIR's preferred alternative (Full Tidal Restoration across approximately 483 acres) extends tidal influence significantly beyond the fourth-class "Lands in Bay" extent established in the Courtney partition, it is proposing to restore conditions that neither the federal survey record nor the court partition record — accepted without objection by landowners with direct knowledge — recognizes as historical. The administrative record contains no analysis of this discrepancy, and does not document that CDFW reviewed the Courtney Map, its Table of Partitions, or the evidentiary significance of the uncontested partition proceedings. The Courtney Map is accessible via The Huntington Library's LAACR digital collection (see Reference [10]) and has been archived on Internet Archive since its digitization.

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4. Warner, Guinn, and Early Accounts

This section establishes the temporal and historical context for the three hydrologic periods defined in Section 1.3: the pre-1815 documented Spanish Colonial period condition, the 1815–1825 anomaly, and the post-1825 independent terminal lagoon.

4.1 J.J. Warner Testimony (1876)

Judge J.J. Warner provided a first-hand account of LA River hydrology, recorded by Judge Benjamin Hayes (1876) and published in Thompson & West (1880): [3:Thompson & West 1880, "Historical Sketch of Los Angeles County"]

> "There was no channel of any consequence to the ocean, previous to 1825... the waters ran into the lagoons and marshes in the region, and spread over the country."

Warner explicitly testified that the LA River had no outlet channel to the ocean before 1825. The 1815–1825 period when river waters reached Ballona was an anomaly caused by a debris dam, not the normal condition.

4.2 J.M. Guinn (1915)

J.M. Guinn, early California historian with access to first-hand accounts, corroborated Warner's testimony regarding the debris dam event and the LA River's termination in inland wetlands prior to 1815. [4]

4.3 Significance

These first-hand accounts from individuals who lived through or had direct knowledge of the events establish that:

1. The LA River had no defined channel to the ocean prior to 1815
2. The 1815–1825 Ballona connection was an anomalous, temporary condition
3. The documented Spanish Colonial period condition was inland basin termination, not ocean outlet

4.4 McMahon (2026) — Convergent Evidence Analysis

A seven-category evidentiary analysis published February 14, 2026 independently corroborates Warner and Guinn through convergent lines of evidence: [16]

1. Spanish expedition accounts
2. Spanish colonial land grants
3. Documented flood chronology
4. Geological and geomorphic studies
5. Sedimentological surveys
6. Cartographic records
7. Indigenous settlement patterns

The convergent weight of these independent sources supports the conclusion that the southward Dominguez–San Pedro corridor was the LA River's predominant documented course during the Spanish Colonial period immediately preceding 1815. Critically, the analysis demonstrates that the 1825 flood represented a **restoration** of that southward route—not the creation of a new one—and that the 1815–1825 westward avulsion toward Ballona was the anomalous condition. [16][21][24:pp.11,80,85,97,240] *This analysis does not claim that the southward route was the exclusive path at all times; it asserts that the Dominguez–San Pedro corridor is the best-documented predominant course during the Spanish Colonial period, with episodic departures documented in Holocene reconstructions.*

The document includes critical counterargument analysis addressing the five most plausible objections to this thesis, providing a framework applicable to regulatory and legal scrutiny. [16]

Implication for restoration planning: CDFW's selection of 1850–1890 as the historical baseline period occurs 25–65 years *after* the most significant natural hydrological change in the LA coastal plain. The baseline period itself therefore represents fundamentally altered conditions, not pre-disturbance hydrology. [19] Whether to use the documented pre-disturbance Spanish Colonial period condition or the post-avulsion regulatory period as the restoration baseline is ultimately a policy question for the agency — but that choice should be made explicitly, with full awareness of what the 1857–68 documentary record shows about conditions after the disturbance.

4.5 Relationship to Holocene Paleoenvironmental Reconstructions (Altschul et al. 2007)

Altschul et al. (2007) [20] document episodic Holocene periods — spanning approximately 7,000 years — during which the predecessor Los Angeles River reached the Ballona area, creating the coastal canyon and submarine fan-delta documented in their study. This report does not dispute those findings. They address geological timescales and prehistoric landscape evolution that predate the historical record on which this report's findings rest. This report's evidentiary scope begins with the documented Spanish Colonial period condition immediately preceding 1815 and addresses the period 1815 to present — a period during which the river's predominant course was southward to San Pedro Bay before the 1815 debris-dam event temporarily redirected flows toward Ballona during the late Spanish Colonial and early Mexican periods. The Hancock Survey (1857–58) and Courtney Partition Map (1867–68) are the authoritative baseline sources for the restoration planning period regardless of what pre-1815 geology shows. That said, Altschul's own data is worth examining because it independently corroborates — rather than contradicts — the terminal-lagoon conditions Hancock documented, as the remainder of this section shows.

What Altschul et al. actually claim:

Altschul et al. document 8,000 years of archaeological settlement and paleoenvironmental change in the Ballona region. Their central geomorphic claim is that "during much of the Holocene, Ballona Creek captured the flow of the much larger Los Angeles River, as evidenced by a massive submarine fan-delta off the coast." Their Figure 2 presents schematic time-slice reconstructions at 7000, 5000, 4000, 3000, 2000, 1000, and 200 BP showing a distributary channel conceptually linked to the LA River at various periods.

This is a Holocene-scale geomorphic and archaeological reconstruction, not a mid-19th-century hydrologic observation. The paper's purpose is to understand prehistoric human adaptation to a dynamic environment over millennia, not to define a regulatory historical baseline for a 21st-century restoration project.

The temporal scale distinction:

The Altschul reconstruction addresses processes operating over thousands of years. This report addresses the restoration planning baseline: specifically, what Hancock's sworn federal survey documented on the ground in 1857–58, and what Courtney's court-certified partition map encoded in 1867–68. These are fundamentally different analytical questions, and evidence appropriate to one is not automatically probative for the other.

Paleoenvironmental evidence of episodic Holocene river capture does not establish sustained river-mouth conditions during the documented historic baseline period. Altschul et al. do not claim otherwise—their paper addresses prehistoric human adaptation over millennia, not 19th-century channel configuration. The claim of this report is not that the LA River *never* reached the

Ballona area at any point in geological history. The claim is precise and bounded: **Ballona was not functioning as a permanent, sustained river-mouth estuary during the historical baseline period relevant to restoration planning**, as documented by the earliest authoritative federal survey evidence.

The submarine fan-delta argument:

The offshore submarine fan-delta cited by Altschul et al. establishes that substantial sediment reached Santa Monica Bay at some periods during the Holocene. It does not establish continuous channel stability, inlet permanence, discharge magnitude in any specific century, or 19th-century surface hydrology. Fan-deltas form from catastrophic floods, episodic avulsion events, and extended periods of intermittent discharge during climatically favorable periods. The fan-delta is evidence of past flow at geological timescales; it is not evidence of the 1857–58 configuration documented by Hancock.

Altschul's own data supports the terminal-lagoon trajectory:

Critically, Altschul's own paleoenvironmental narrative is consistent with—and independently corroborates—the terminal-lagoon conditions Hancock documented. Altschul et al. explicitly document progressive sedimentation, decreasing open water, and transition to marsh-dominant conditions throughout the Holocene. By their own account, "by 1000 BP, the Ballona Lagoon became a sediment-choked estuary" (Altschul et al. 2007:36–40) and settlement contracted to the lagoon edge. Their Figure 2 shows that by 200 BP the system is heavily marsh-fragmented. **This long-term evolutionary trajectory—open embayment → sediment infill → restricted inlet → marsh dominance—is entirely consistent with Hancock's 1857–58 documentation of an "interior lake" with a 5–6 foot obstructed inlet. Altschul describes the geological process; Hancock documented conditions consistent with the terminal phase of that evolutionary trajectory.**

The regulatory relevance boundary:

Holocene paleoenvironmental reconstructions operating at millennial timescales address a fundamentally different analytical question than the 1857–68 survey evidence. The planning documents describe a post-avulsion 19th-century historical period as the baseline context. The 1857–68 documentary record directly addresses that stated period; Altschul et al. does not.

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5. LA River Watershed Incompatibility

5.1 Watershed Size Comparison

- **Ballona Creek watershed**: ~130 square miles [9]
- **LA River watershed**: ~870 square miles [9]

- **Ratio**: LA River watershed is 6.7 times larger

5.2 Hydraulic Implications

A watershed 6.7 times larger produces higher sustained flows, greater fluvial scour capacity, the ability to maintain a permanent open channel to ocean, larger sediment loads, and different vegetation communities.

5.3 Hancock Conditions vs. Expected LA River Outlet Conditions (Table 1)

Comparing observed conditions (1857–58) with expected conditions if LA River had been discharging through Ballona for 32 years (1825–1857):

Characteristic	Ballona Terminal Lagoon (Hancock observations 1857–58)	Expected if LA River Outlet (approximately 32–33 years of discharge 1825–1857/58)
Inlet status	Intermittently closed ("often obstructed" [1:Vol.199,p.310])	Permanent open channel maintained by sustained fluvial scour
Inlet dimensions	5–6 feet wide, 86 feet long [1:Vol.199,p.305] (measured precisely by Hancock)	On the order of tens to hundreds of feet wide, consistent with comparable Southern California river mouths draining watersheds of similar scale
Watershed size	~130 sq mi (local Ballona watershed) [9]	~870 sq mi (LA River watershed = 6.7× larger)
Discharge regime	Modest seasonal local runoff; two perennial streams (Ballona, Centinela)	High sustained discharge from large upstream watershed; year-round flows maintaining channel
Salinity	Mixed tidal/evaporation control; brackish to hypersaline [5][6]	River-dominated freshwater to brackish gradient; estuarine salinity structure
Morphology	Terminal lagoon and marsh complex; back-barrier lagoon	Linear channelized river mouth with potential delta formation or ebb-tidal delta

Characteristic	Ballona Terminal Lagoon (Hancock observations 1857–58)	Expected if LA River Outlet (approximately 32–33 years of discharge 1825–1857/58)
Hydrologic character	"Interior lake" (Hancock professional assessment) [1:Vol.199,p.310]	Open river-mouth estuary with continuous ocean exchange; never described as "lake"
Channel maintenance	Inlet closes seasonally; requires high flows to breach sand bar	Channel kept open year-round by sustained river discharge preventing closure
Sediment regime	Local watershed sediment; lagoon gradual infilling	Large upstream sediment load transported to coast; active delta progradation or offshore deposition
Vegetation indicators	Lagoon-adapted communities; hypersaline-tolerant species	Estuarine marsh communities adapted to freshwater-brackish gradient and regular tidal flushing
Creek discharge point	Ballona Creek discharges into lagoon ~1.25 miles inland from inlet [1:Vol.199,p.303]	Creek would be tributary to larger river channel flowing directly to ocean
Ephemeral features	Dry lake beds documented in watershed [1:Vol.199,p.308]	No seasonal dry lakes; sustained river flows would maintain wetted conditions

Table 1: Comparison of Hancock's documented Ballona conditions (1857–58) versus expected conditions if the Los Angeles River had been discharging through Ballona continuously for approximately 32–33 years (1825–1857/58). The fundamental incompatibility strongly indicates that LA River flows were not using Ballona as their outlet during this period. A watershed 6.7 times larger than Ballona's would create and maintain conditions entirely different from what Hancock observed and measured.

The observed characteristics—particularly the "interior lake" designation, 5–6 foot inlet width, and frequent closure—are diagnostic of a small terminal lagoon system fed by local watershed, not a river mouth receiving discharge from a watershed 6.7 times larger over an approximately 32–33-year period.

The incompatibility argument is an inference based on comparative fluvial geomorphology and the watershed size ratio documented in Reference [9]; this report welcomes independent hydraulic modeling to test and quantify these relationships.

Even absent spring contribution, watershed-scale disparity alone would preclude sustained river-mouth morphology at the dimensions Hancock documented.

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6. Terminal Lagoon Hydrology

6.1 Intermittent Coastal Lagoons

Ballona's documented characteristics match California's intermittently closed coastal lagoons: [5][6][7]

Typical features:

- Small watersheds (tens to hundreds of square miles)
- Seasonal inlet closure
- Back-barrier morphology
- Variable salinity regimes (fresh to hypersaline)
- Limited inland extent
- Ephemeral water bodies in watershed

California examples:

- Mugu Lagoon (~250 sq mi watershed)
- Carpinteria Salt Marsh (~13 sq mi watershed)
- Devereux Slough (~1 sq mi watershed)

6.2 Ballona's Terminal Lagoon Character

Hancock's 1857–58 documentation establishes Ballona as a terminal lagoon:

- Local watershed (~130 sq mi)
- "Often obstructed" inlet [1:Vol.199,p.310]
- Small inlet dimensions (5–6 feet) [1:Vol.199,p.305]
- Limited inland extent (1.6 miles) [1:Vol.199,p.307]
- Ephemeral lake beds [1:Vol.199,p.308]
- Creek discharge into lagoon, not ocean [1:Vol.199,p.303]

Freshwater spring hydrology — the independent sustaining mechanism across all three hydrologic periods:

The role of Ballona's native spring system is essential to understanding the watershed's hydrology in each of the three periods defined in Section 1.3, and its collapse is a primary disturbance that restoration planning must address independently of decisions about tidal extent.

Pre-1815 (Spanish Colonial period — documented historical condition): Before the 1815 debris-dam event diverted LA River flows westward, the Ballona watershed was sustained entirely by its own local hydrology. The Ballona watershed historically contained 45 mapped freshwater springs (documented 1850–1890), concentrated primarily in the Santa Monica Mountain foothills from Beverly Hills to Franklin Canyon, with the Centinela area providing major contributions as well. [17][18] These springs fed Ballona Creek, Centinela Creek, and the smaller tributary drainages that sustained the terminal lagoon complex. Major contributors included Centinela Springs (269,000–404,000 gallons per day naturally; developed to 900,000 gallons per day capacity by 1890) and the Kuruvungna/Tongva springs at the University High School site (still producing 22,000–25,000 gallons per day as of 2026, 8,000–10,000 years of documented indigenous use). [17][18] The estimated combined historical discharge from all 45 springs was 2–5 million gallons per day (conservative estimate based on the Hall 1888 survey [23]); a broader analysis incorporating smaller and less-documented springs yields 3.5–7.5 million gallons per day [18]. For regulatory baseline purposes this report uses the 2–5 MGD range as the operative estimate; the 3.5–7.5 MGD figure represents an upper-bound sensitivity case incorporating smaller and less completely documented sources. During the documented Spanish Colonial period immediately preceding 1815, this spring system maintained the Ballona wetland complex as a productive, watershed-sustained terminal lagoon independent of the LA River's predominant course. Earlier geological episodes in which the predecessor river episodically reached the Ballona area — including those that created the coastal canyon and submarine fan-delta documented by Altschul et al. [20] — predate the historical record that is the subject of this report and do not affect its findings about the 1815–present period.

1815–1825 (debris-dam anomaly): During the brief decade when the LA River debris dam redirected river flows westward toward Ballona, the terminal lagoon received both its native spring discharge and the anomalous overland flow from the much larger LA River watershed (approximately 870 square miles versus Ballona's 130). The combination would have substantially increased wetland extent and altered salinity regimes during high-flow events. However, as documented by Warner, Guinn, and Reagan [3][4][24], this was a temporary condition driven by an artificial obstruction, not a natural channel configuration, and it lasted approximately ten years. The 1825 flood removed the obstruction and restored the pre-existing southward course to San Pedro Bay.

Post-1825 through USACE channelization (1825–c.1938): With the LA River's departure in 1825, the spring system resumed its role as the primary documented sustaining mechanism for the Ballona wetland complex. This is precisely why Hancock's 1857–58 observations document a functional, productive terminal lagoon — not a desiccated remnant — despite the LA River's absence for approximately 32–33 years. The continued existence of productive inland marsh

and irrigable interior lands after 1825 is consistent with sustained freshwater input from the documented spring systems within the watershed — an inference independently corroborated by the Courtney referees' classification of interior lands as first-class irrigable property in 1868, forty-three years after the LA River's departure. [17][18]

This condition persisted, with progressive reduction from agricultural development and groundwater pumping, until the U.S. Army Corps of Engineers Ballona Creek Flood Control Channel project, which was constructed primarily in the 1930s and completed by approximately 1938. The channelization project concretely lined Ballona Creek, eliminated the natural connection between the spring-fed upland watershed and the terminal lagoon complex, and converted a system of seasonal meanders, marsh distributaries, and lagoon inflows into a single engineered channel designed to discharge floodwaters directly to the ocean. The channelization accomplished what the 1825 avulsion did not: it permanently severed the link between spring discharge in the foothills and the coastal wetland system.

Today, 96–98% of the original spring discharge has been lost to groundwater overdraft relative to late-19th-century documented discharge levels; only approximately 2% of Ballona Creek's current dry-season baseflow originates from natural springs, with 98% being urban runoff. [17][18] The collapse of the spring system is therefore a layered disturbance: channelization eliminated the physical pathway by which spring water reached the wetland complex, and groundwater overdraft eliminated most of the spring water itself. Restoration planning that focuses exclusively on tidal hydrology without addressing the near-total loss of the watershed's original freshwater base is addressing one disturbance while ignoring an equally fundamental one.

With Hancock, Courtney, and spring hydrology all pointing to an independent terminal lagoon, we can now evaluate where modern planning went wrong in reconstructing the historical baseline.

6.3 Not a River-Mouth Estuary

River-mouth estuaries have large upstream watersheds (hundreds to thousands of square miles), permanent ocean connection, substantial channel dimensions, riverine freshwater influence, and linear channelized morphology. Ballona lacked all of these characteristics in 1857–58.

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7. Historical Ecology Misinterpretation

7.1 T-Sheet Reliance

Modern restoration planning has relied heavily on U.S. Coast Survey T-Sheet No. 1432b (1876) but does not appear to analyze or cite earlier Hancock (1857–58) and Courtney (1867–68) documents. [5][13][14][15]

Chronological precedence:

- Hancock survey: 1857–58 (earliest detailed government documentation)
- Courtney partition: 1867–68 (official land classification with direct Hancock citation)
- T-Sheet 1432b: 1876 (18 years after Hancock)

7.2 Selective Source Use and Specification Integrity

The flood capacity history for Ballona Creek illustrates a separate but related issue of specification integrity within the administrative record.

The February 1979 U.S. Army Corps of Engineers (USACE) hydrologic analysis for Ballona Creek establishes **68,000 cubic feet per second (cfs) as the Standard Project Flood (SPF)** applicable to the system. [22:passim] The Standard Project Flood is the Corps' design discharge used for evaluating flood protection infrastructure and project compatibility.

The same 1979 analysis also documents **approximately 72,000 cfs of channel conveyance capacity upstream of the Lincoln Boulevard Bridge**. [22:passim] This value reflects the computed hydraulic capacity of a specific upstream channel reach. It is not a separate design flood standard, and it does not conflict with the 68,000 cfs SPF. The two figures represent distinct engineering quantities:

- **68,000 cfs — Standard Project Flood (design discharge)**
- **~72,000 cfs — physical conveyance capacity of upstream channel section at Lincoln Boulevard Bridge**

The original Ballona Wetlands EIR relied on a **46,000 cfs figure**, derived from earlier design-era specifications associated with the 1930s channel configuration. That number is below the Corps' 68,000 cfs Standard Project Flood established in the 1979 hydrologic analysis.

In May 2023, the Los Angeles County Superior Court ruled that the EIR failed to adequately disclose and analyze relevant flood control parameters, including the Corps' flood standard. The September 2023 decertification followed from that ruling.

The specification issue in the flood control context is therefore straightforward:

- The Corps' adopted design flood standard (68,000 cfs SPF) existed in the 1979 hydrologic record [22:passim]
- The EIR used 46,000 cfs
- The court found the analysis insufficient

The 72,000 cfs channel capacity figure provides hydraulic context for the upstream reach but does not alter the design requirement. The flood capacity episode does not depend on a 68,000 vs. 72,000 comparison.

The relevance to this report is methodological. The flood capacity issue demonstrates the consequences of relying on outdated specifications when higher-authority federal documentation is available in the record. The same methodological pattern — privileging later or weaker sources over earlier, higher-authority documentation — appears in the historical baseline analysis, as documented below.

Parallel Pattern Table:

Issue	**Inadequate Specification Used**	**Authoritative Source**	**Result**
Flood Capacity	46,000 cfs (original EIR)	68,000 cfs SPF; ~72,000 cfs upstream channel capacity at Lincoln Boulevard Bridge (1979 USACE) [22:passim]	May 2023 court ruling; September 2023 EIR decertification
Historical Baseline	T-Sheet 1432b (1876)	Hancock survey (1857-58) + Courtney map (1867-68)	18–19 years earlier; superior evidentiary authority
Conceptual Baseline Period Selection	1850–1890 (post-avulsion)	Pre-1815 ancestral hydrology [16][19]	Baseline period begins 25–65 years after the defining hydrological event

Because the court has already ruled once on inadequate use of primary sources (flood capacity), the same methodological issue appears independently in both flood capacity and baseline analysis — and is not a hypothetical concern. The Revised EIR preparation (2026) is the direct opportunity to address both deficiencies simultaneously.

A formal logical consistency analysis of CDFW's historical baseline methodology documents a logical inconsistency within the administrative record: mutually incompatible claims about historical conditions are carried forward simultaneously, never reconciled, while restoration

design proceeds as if no logical problem exists. For example, the EIR both (a) acknowledges post-1825 terminal-lagoon conditions and (b) selects a full-tidal restoration target without citing historical support for persistent tidal connection. [19]

The contrast between the modern engineered system and the historical baseline makes this consequential. The February 1979 USACE channel was designed for the 68,000 cfs Standard Project Flood — a system that bears no hydraulic resemblance to what Hancock documented in 1857–58: a terminal lagoon with intermittent ocean connection, limited inland tidal extent (~1.6 miles), local watershed flows (~130 square miles), no concrete confinement, and natural inlet closure dynamics. The flood capacity figures are relevant to regulatory compliance and infrastructure compatibility, but they do not define the historical ecological baseline. They illustrate the degree to which the present system is a modern engineered construct entirely distinct from the documented 19th-century hydrologic condition.

7.3 Absence of Explicit Baseline Definition — EIS/EIR Section 2.3.7

The Draft EIS/EIR contains no explicit definition of a historical baseline period anywhere in the administrative record. The period 1850–1890 appears only once — in Section 2.3.7, Alternative 11: 19th Century Wetlands — where it is used to characterize the scope of Dark et al. (2011), not to define a restoration baseline.

Critically, the EIS/EIR's own language in that passage acknowledges the post-avulsion character of the period it relies upon:

> "the final report from this study provides information about the configuration of the historic Ballona Wetlands and its surrounding watershed in the period of 1850-1890, **after the Los Angeles River had migrated its outlet away from Ballona Wetlands** but before extensive human development had occurred." [14]

The same section goes on to describe the resulting hydrology accurately:

> "Without the inflow from the Los Angeles River, the wetlands were often closed to the ocean by a sand berm along the beach, causing perching of water within the lagoon wetlands." [14]

This is an independent corroboration of Hancock's 1858 observation that the connection with the sea was "often obstructed" [1:Vol.199,p.310] — documented 168 years earlier under sworn federal survey authority. The two phrases ("often closed to the ocean by a sand berm" and "often obstructed") are not identical quotations but describe the same physical phenomenon: intermittent inlet closure by natural sediment deposition, consistent with terminal lagoon dynamics.

The EIS/EIR thus simultaneously: (1) acknowledges that the 1850–1890 period is post-avulsion; (2) accurately describes the resulting terminal lagoon hydrology; and (3) never reconciles these acknowledged conditions with the restoration targets specified elsewhere in the document.

Alternative 11, which would have restored to the 19th-century conditions the EIS/EIR itself describes, was rejected as infeasible. No explicit baseline definition appears in its place.

This internal inconsistency in the administrative record is documentable from the EIS/EIR's own text without reference to any external source.

The chosen alternative makes this internal inconsistency consequential, not merely academic. Alternative 1: Full Tidal Restoration/Proposed Action — the preferred alternative — imposes permanent, sustained tidal connection across approximately 483 acres in two committed phases: Phase 1 restoring Area A, North Area B, and Area C with realignment of Ballona Creek; Phase 2 completing full tidal restoration of West Area B. Nowhere in the description of Alternative 1 does the EIS/EIR cite a historical baseline establishing that permanent, sustained tidal connection characterized the Ballona terminus. The evidentiary gap is direct: the only historical condition the EIS/EIR accurately describes — "wetlands were often closed to the ocean by a sand berm" (Section 2.3.7) and "intermittently tidal wetland habitat...in which the water-control structures would close to limit tidal circulation and create ponded/evaporative conditions" (Section 2.2.2, Areas A and B options) — is the terminal lagoon condition documented by Hancock in 1858. That condition appears in the EIS/EIR not as the restoration target but as a managed sub-option. The administrative record does not document a historical basis within the stated 1850–1890 reference period for permanent full tidal connection.

An agency may, in principle, select a paleogeomorphic reference condition as a restoration target. The planning documents did not do so. They describe a post-avulsion 19th-century historical condition as the baseline context, yet the preferred alternative imposes permanent full tidal restoration without reconciling that design choice against the 1857–68 documentary record of intermittent closure. The absence of that reconciliation is the evidentiary gap this report identifies.

7.4 Baseline Errors

Omitting Hancock and Courtney documentation has led to overstated historical tidal penetration, incorrect salinity regime assumptions, mischaracterization of river influence, and design specifications incompatible with documented baseline conditions.

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8. Chronology and Pattern of Omission

Key dates:

- **1857–1858** — Hancock field notes: "interior lake," "often obstructed" connection to sea [1:Vol.199,p.310]
- **July 1858** — Hancock plat: official map showing "Inner Bay" and "Obstructed Connection"

- **September 19, 1858** — U.S. Surveyor General J.W. Mandeville approves field notes and plat
- **1867–1868** — Courtney: four land classes based on Hancock survey, "Lands in Bay" limited to coastal fringe; adversarial legal proceeding with fiduciary referees; Table of Partitions published; no documented objection to classifications during the formal proceeding (see Section 3.6)
- **March 1869** — Hancock plat published in *San Francisco Times* and *Los Angeles Republican*; 90-day public inspection period (no protests documented)
- **November 1872** — U.S. Surveyor General J.R. Hardenbergh certifies Hancock plat accuracy
- **1876** — T-Sheet 1432b [5][13]
- **c.1930–1938** — USACE Ballona Creek Flood Control Channel construction; concrete lining severs physical connection between spring-fed upland watershed and terminal lagoon complex; natural terminal lagoon hydrology permanently eliminated

Pattern of omission:

Modern restoration planning documents cite T-Sheet 1432b extensively but do not appear to analyze or cite: [5][13][14][15]

1. Hancock's "interior lake" characterization [1:Vol.199,p.310]
2. Hancock's inlet dimensions (5–6 feet) [1:Vol.199,p.305]
3. Hancock's lagoon extent documentation (~1.6 miles) [1:Vol.199,p.307]
4. Hancock's plat showing "Inner Bay" and "Obstructed Connection"
5. Public newspaper advertisement and 90-day inspection period (no protests)
6. Courtney's four-class land system with limited "Lands in Bay"
7. Multiple federal certifications spanning 1858–1872

This selective use of primary sources has resulted in baseline assumptions inconsistent with the earliest, most authoritative government documentation.

This report does not speculate on agency intent; complex multi-decade environmental review processes routinely develop gaps in primary source coverage, and the conclusion here is solely about evidentiary hierarchy: the administrative record does not document that the Hancock and Courtney sources were analyzed in the publicly available EIR text and appendices reviewed by this report.

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9. Implications for Restoration

9.1 Baseline Definition

Documented historical baseline (1857–58, 1867–68):

- Terminal lagoon with "often obstructed" inlet
- Limited inland tidal extent
- Fourth-class "Lands in Bay" confined to narrow coastal zone
- Interior lands productive agricultural property

Modern restoration assumptions:

- Often assume extensive tidal penetration
- May overstate historical river influence
- May base design on T-Sheet without evaluating earlier Hancock/Courtney documentation
- The baseline period implicit in planning documents (1850–1890, per Dark et al. 2011 as cited in EIS/EIR Section 2.3.7) begins 25–65 years after the most significant natural hydrological event (the 1825 LA River avulsion) — a post-disturbance period that the EIS/EIR itself acknowledges as such. [14][19]
- Do not account for the near-total collapse (96–98% reduction) of the spring-fed freshwater system that historically sustained the wetlands independently of the LA River [17][18]

9.2 Design Implications

If restoration design is based on overstated tidal extent assumptions, it may attempt to restore conditions that never existed during the documented historical baseline (1857–68) established by Hancock and Courtney, may extend tidal influence beyond documented historical extent, and may not account for terminal lagoon hydrology (inlet closure, hypersalinity, ephemeral water bodies).

9.3 Need for Primary Source Integration

Restoration planning should incorporate:

- Hancock field notes and plat (1857–58) [1:Vol.199,pp.298-314]
- Courtney partition map land classifications (1867–68)
- Public notice and inspection period (1869) with no documented protests
- Multiple federal certifications (1858–1872)
- Warner, Guinn, and other first-hand accounts [3]
- Terminal lagoon hydrology principles [5][6][7]
- Multi-category convergent evidence for pre-1815 southward LA River course [16]
- Historical spring hydrology documentation (45 springs, 2–5 MGD historical discharge) [17][18]
- Logical consistency review of baseline period selection methodology [19]

The documentary record examined in this report presents three independent, mutually reinforcing lines of evidence for the terminal lagoon baseline. First, the Hancock federal survey (1857–58) provides sworn, measured, officially certified physical documentation of a small intermittently closed lagoon with a 5–6 foot inlet — not a river mouth. Second, the Courtney partition map (1867–68), created under court order with fiduciary obligation to competing landowners, independently encodes the same hydrological reality through its four-class land classification. Third, the spring hydrology record establishes that the Ballona wetland complex was self-sustaining through its own watershed independent of any LA River connection, explaining why Hancock found a productive lagoon system 32–33 years after the river's departure. Each line of evidence stands independently; together they converge on a single conclusion: the restoration planning baseline for Ballona is a watershed-sustained terminal lagoon, not a persistent river-mouth estuary.

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10. Findings and Recommendations

10.1 Findings

1. Available historic-period documentation does not support that Ballona Creek functioned as a permanent, sustained outlet for the LA River; the 1815–1825 connection was an anomalous 10-year period caused by a debris dam. The LA River's predominant documented course during the Spanish Colonial period ran southward through the Dominguez Gap to San Pedro Bay, with episodic departures documented in Holocene reconstructions; the 1825 flood restored that route rather than creating it. [3][5][16][21][24:pp.11,80,85,97,240] This conclusion reflects the best-supported interpretation among currently published lines of evidence; this report acknowledges that Holocene paleoenvironmental reconstructions document episodic departures from the dominant southward pathway, as addressed in Section 4.5.

2. The documented historical baseline (1857–68) is a terminal lagoon fed by local watershed flows (130 sq mi), explicitly characterized as an "interior lake" by Hancock in 1858. [1:Vol.199,p.310]

3. Hancock (1857–58) provides official documentation of terminal lagoon conditions through both field notes and approved plat, with official authority including sworn testimony, federal approval by U.S. Surveyor General, public newspaper advertisement (1869), and 90-day inspection period with no documented protests. [1:Vol.199,pp.298-314] Courtney (1867–68) provides an officially binding land classification based on Hancock's survey.

4. The Courtney Map's four-class system documents that only a narrow coastal fringe was officially classified as "Lands in Bay" (fourth-class), while interior parcels were first-class (irrigable) and second-class (dry farming) lands.

5. Modern restoration planning has relied heavily on the 1876 T-Sheet while the Hancock and Courtney documentation does not appear to have been incorporated into baseline analysis, resulting in baseline assumptions inconsistent with the earliest authoritative sources. This pattern parallels the flood capacity issue documented in Section 7.2, where reliance on inadequate specifications despite availability of authoritative sources led to the May 2023 court ruling and September 2023 EIR decertification. Furthermore, CDFW's selection of 1850–1890 as the historical baseline period begins 25–65 years after the defining hydrological event (the 1815–1825 LA River avulsion), meaning the chosen baseline represents post-disturbance, not pre-disturbance, conditions — compounding the incomplete integration of the earliest primary sources. [19]

6. **The primary source documents analyzed in this report (Hancock Field Notes, Hancock Plat, Courtney Map) are publicly accessible through the U.S. Bureau of Land Management General Land Office Records database (https://glorecords.blm.gov/search/default.aspx) — a federal government resource — and have additionally been archived on Internet Archive since March 18, 2024.** The documents were publicly accessible; the administrative record does not document agency analysis of them. This report does not speculate on agency intent; it focuses on the consequences of incomplete primary source review for baseline definition.

10.2 Recommendations

Context: As of February 2026, CDFW is preparing a Revised EIR following the September 2023 decertification that resulted from the May 2023 Los Angeles County Superior Court ruling regarding inadequate disclosure and analysis of flood control parameters. This Revised EIR process provides an opportunity to address both the flood capacity specifications (46,000 cfs original EIR figure vs. the 68,000 cfs Standard Project Flood established in the 1979 USACE hydrologic analysis [22:passim]) and the incomplete incorporation of earliest authoritative baseline documentation (Hancock 1857-58, Courtney 1867-68).

Immediate actions:

1. **The Revised EIR would benefit from deferring design work on tidal restoration footprint** pending comprehensive primary source analysis incorporating Hancock survey field notes [1:Vol.199,pp.298-314], Hancock plat (July 1858, approved September 1858, publicly advertised March 1869), and Courtney partition map (Case No. 965) data

2. **The Revised EIR record would benefit from including a response** to Hancock's "interior lake" characterization [1:Vol.199,p.310] and "often obstructed" inlet documentation, with explanation of why these sworn federal observations were not incorporated in baseline analysis

3. **Technical review of all tidal extent, salinity regime, and hydrologic connectivity assumptions** is warranted against:

- Hancock's documented inlet dimensions (5–6 ft wide, 86 ft long) [1:Vol.199,p.305]
- Hancock's documented lagoon extent (130 chains / 1.6 miles inland) [1:Vol.199,p.307]
- Courtney's fourth-class "Lands in Bay" spatial extent
- Terminal lagoon hydrology principles (inlet closure, hypersalinity, ephemeral features)

4. **Provide overlay map** showing Areas A and B restoration boundary superimposed on 1868 fourth-class "Lands in Bay" extent for public review, to determine whether the modern restoration footprint exceeds the documented historical "bay" classification

Documentation corrections:

1. **The Revised EIR record would benefit from** incorporating Hancock field notes [1:Vol.199,pp.298-314], Hancock plat (with 1869 public notice and no documentation of protests in the record), and Courtney partition map as primary baseline sources with chronological precedence over T-Sheet 1432b. Addressing both flood capacity specifications (68,000 cfs Standard Project Flood per 1979 USACE [22:passim]) and historical baseline characterization (terminal lagoon per Hancock/Courtney) would avoid repeating the specification errors that led to the May 2023 court ruling and September 2023 EIR decertification.

2. **Correct CDFW web content** and project materials to reflect terminal lagoon baseline with explicit reference to Hancock's "interior lake" characterization [1:Vol.199,p.310]

3. **Revise hydrologic narratives** to accurately represent the three periods: pre-1815 (inland basin termination), 1815–1825 (debris-dam anomaly), post-1825 (independent terminal lagoon)

4. **Acknowledge omission** of Hancock plat public notice and 90-day inspection period with no documented protests — there is no evidence in the record that any party challenged the "Inner Bay" / "Obstructed Connection" depiction despite formal opportunity to do so

Regulatory review:

Both patterns reflect a consistent reliance on later interpretive sources while earlier, higher-authority primary documentation remains unaddressed in the administrative record. The May 2023 court ruling and September 2023 EIR decertification demonstrate that incomplete primary source verification and specification errors have material consequences for project approval. The Revised EIR preparation (2026) provides an opportunity to correct both deficiencies through comprehensive integration of:

1. Authoritative flood capacity specifications (68,000 cfs Standard Project Flood per 1979 USACE [22:passim])
2. Earliest authoritative baseline documentation (Hancock 1857-58, Courtney 1867-68)

The planning record would benefit from documentation of agency review of Hancock and Courtney documents and rationale for any prior omission. Given the public accessibility of these documents via Internet Archive, the planning record should clarify when and how agencies reviewed these sources and what analysis supported reliance on later sources.

Addressing these documented deficiencies in the Revised EIR would avoid repeating the same pattern that led to the original EIR decertification.

10.3 Geographic Overlay Analysis (Future Work)

Proposed for future revision:

1. **Overlay Courtney fourth-class "Lands in Bay" extent on modern Areas A and B restoration footprint**

    - Hypothesis: Areas A and B extend significantly inland of 1868 official tidal classification
    - Method: Georectify Courtney Map to modern coordinate system; overlay with Areas A and B boundaries

2. **Compare Hancock lagoon terminus (130 chains inland) with modern tidal restoration extent**

    - Hypothesis: Modern plans extend tidal influence beyond 1858 documented extent
    - Method: Plot Hancock stations and measurements on modern topography

3. **Correlate fourth-class land locations with modern elevation/topography**

    - Hypothesis: Fourth-class lands correspond to lowest elevations only
    - Method: DEM analysis of Courtney fourth-class parcel locations

Data requirements:

- High-resolution scans of complete Courtney Map
- Ground control points for georectification
- Modern Areas A and B restoration boundary shapefiles
- Historical DEM reconstruction or modern DEM as proxy

This analysis would provide quantitative evidence of the discrepancy between 1868 official tidal classifications and modern restoration tidal extent assumptions.

Appendix A: Primary Source Map Documentation

This appendix presents the two authoritative primary source maps that document terminal lagoon conditions at Ballona during the 1857–68 baseline period: the Hancock Survey Plat (July 1858) and the Courtney Partition Map (May 1868). Both are sworn federal and court-certified documents. Both are reproduced here as the evidentiary record on which this report's findings rest.

A.1 Hancock Survey Plat (July 1858)

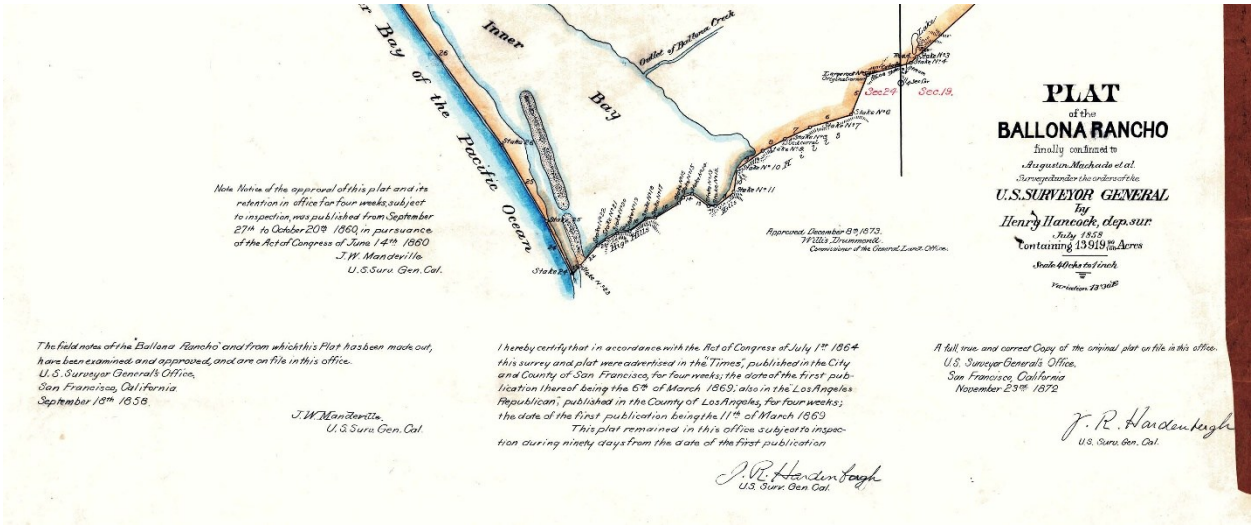

Inner
Bay
Bay of the Pacific Ocean
Outlet of Ballona Creek
PLAT
of the
BALLONA RANCHO
finally confirmed to
Augustin Machado et al.
Surveyed under the orders of the
U.S. SURVEYOR GENERAL
by
Henry Hancock, dep. sur.
July 1858
containing 13919 Acres
Scale 40 chs to 1 inch.
Sec 24
Sec 19.
Note. Notice of the approval of this plat and its retention in office for four weeks, subject to inspection, was published from September 27th to October 20th 1860 in pursuance of the Act of Congress of June 14th 1860
J.W. Mandeville
U.S. Surv. Gen. Cal.
Approved, December 9th 1873.
Willis Drummond.
Commissioner of the General Land Office.
The field notes of the "Ballona Rancho" and from which this Plat has been made out, have been examined and approved, and are on file in this office.
U.S. Surveyor General's Office,
San Francisco, California
September 18th 1858.
J.W. Mandeville
U.S. Surv. Gen. Cal.
I hereby certify that in accordance with the Act of Congress of July 1st 1864 this survey and plat were advertised in the "Times," published in the City and County of San Francisco, for four weeks; the date of the first publication there of being the 6th of March 1869; also in the Los Angeles "Republican," published in the County of Los Angeles, for four weeks; the date of the first publication being the 11th of March 1869
This plat remained in this office subject to inspection during ninety days from the date of the first publication
J.R. Hardenbergh
U.S. Surv. Gen. Cal.
A full, true, and correct Copy of the original plat on file in this office.
U.S. Surveyor General's Office,
San Francisco, California
November 23rd 1872
J.R. Hardenbergh
U.S. Surv. Gen. Cal.

Figure A-1: Plat of the Ballona Rancho, surveyed by Henry Hancock, Deputy U.S. Surveyor, under orders of the U.S. Surveyor General, July 1858. Total area: 13,919 acres. Scale: 40 chains to 1 inch. The document records: (upper map area) "Inner Bay" and "Outlet of Ballona Creek" — Hancock's field notation of a narrow, obstructed tidal connection; (lower left) field notes certification by J.W. Mandeville, U.S. Surveyor General, California, September 18, 1858; (lower center) public notice certification — advertised in the San Francisco "Times" and Los Angeles "Republican," first publication March 11, 1869, with 90-day public inspection period; (lower right) copy certification by J.R. Hardenbergh, U.S. Surveyor General, California, November 23, 1872; (center) approval by Willis Drummond, Commissioner of the General Land Office, December 9, 1873. No challenges to the survey were recorded during the public inspection period. [Archived by Tom McMahon, Playa del Rey, CA]

(SEE LAST PAGE FOR FULL MAP)

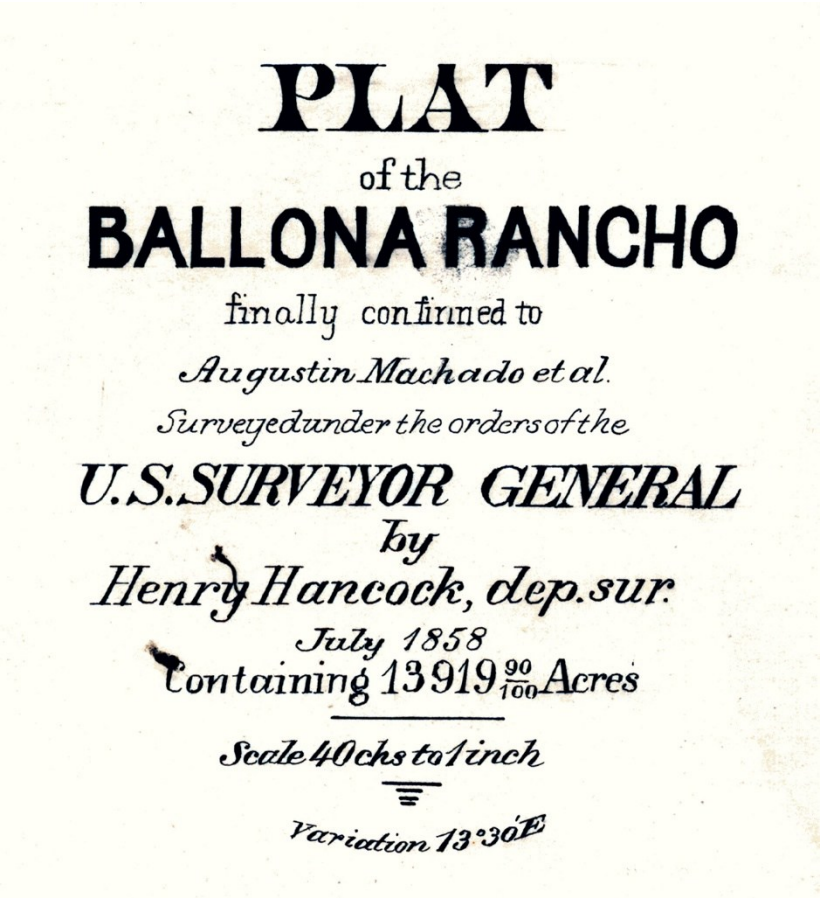


Figure A-2: Title block detail, Plat of the Ballona Rancho. Henry Hancock, Deputy Surveyor, acting under orders of the U.S. Surveyor General. Survey date: July 1858. Total area: 13,919 90/100 acres. Scale: 40 chains to 1 inch. Magnetic variation: 13°30'E. This sworn federal survey document constitutes the earliest authoritative measurement record of the Ballona Rancho and its terminal lagoon configuration. [Archived by Tom McMahon, Playa del Rey, CA]

Digital Access: Complete high-resolution scans of the Hancock Plat and Field Notes are publicly accessible via Internet Archive:

- **Plat**: https://archive.org/details/rancho-ballona-hancock-survey-obstructed-connection-with-the-sea-april-17-1857/Plat%20of%20the%20Ballona%20Rancho%2C%20Hancock%20Survey%2C%20July%201858/
- **Field Notes**: https://archive.org/details/rancho-ballona-hancock-survey-obstructed-connection-with-the-sea-april-17-

1857/Rancho%20Ballona%2C%20Hancock%20Survey%2C%20Obstructed%20Connection%20With%20The%20Sea%2C%20April%2017%2C%201857/

[Archived by Tom McMahon, Playa del Rey, CA, for permanent public access]

A.1.1 Legal Authority and Certification Chain

Initial Approval — September 18, 1858

> "The field notes of the Ballona Rancho and from which this Plat has been made out, have been examined and approved, and are on file in this office. U.S. Surveyor General's Office, San Francisco, California September 19th 1858 J.W. Manderville U.S. Survr. Gen. Cal."

Within two months of field completion, the U.S. Surveyor General for California examined both the field notes and this plat, approved them, and filed them as official federal records.

Public Advertisement and Inspection — March–June 1869

> "I hereby certify that in accordance with the Act of Congress of July 1st 1864 this survey and plat were advertised in the Times, published in the City and County of San Francisco for four weeks; the dates of the first publication thereof being the 6th of March 1869; also in the Los Angeles Republican, published in the County of Los Angeles, for four weeks; the date of the first publication being the 11th of March 1869. This plat remained in this office subject to inspection during ninety days from the date of the first publication. J.R. Hardenburgh U.S. Survr. Gen. Cal."

This was not an obscure document. The plat was published in the *San Francisco Times* for four weeks beginning March 6, 1869, and in the *Los Angeles Republican* for four weeks beginning March 11, 1869, with a 90-day public inspection period available at the U.S. Surveyor General's Office. Any interested parties — including LA River water users, downstream property owners, or irrigation interests — had full formal opportunity to contest any aspect of the survey during this period, including the "Inner Bay" and "Obstructed Connection" characterizations. There is no evidence in the record that any party challenged these designations, despite formal opportunity to do so.

Certified Copy — November 23, 1872

> "A full, true and correct Copy of the original plat on file in this office. U.S. Surveyor General's Office, San Francisco, California November 23rd 1872 J.R. Hardenbergh U.S. Survr. Gen. Cal."

Fourteen years after the original survey, a new U.S. Surveyor General certified this as an accurate copy of the official plat on file, confirming its continued status as the document of record.

A.1.2 Map Features

1. **"Inner Bay" Label**: Visible in the terminal lagoon area, corroborating field notes description of an enclosed lagoon rather than an open river mouth
2. **"Outlet of Ballona Creek"**: Notation at the narrow coastal inlet, consistent with "obstructed connection" terminology in the field notes
3. **"Obstructed Connection" Notation**: Visual depiction at the inlet area, directly corresponding to field notes statement "the connection with the sea is often obstructed" [1:Vol.199,p.310]
4. **Ballona Creek and Tributaries**: Shows creek systems discharging into the "Inner Bay" rather than flowing directly to ocean
5. **Rancho Boundaries**: Defines the 13,919-acre extent
6. **Scale and Orientation**: 40 chains to 1 inch; magnetic variation 13°30′E

A.1.3 Complete Documentary Timeline

1. **April 17, 1857**: Instructions issued to Hancock by U.S. Surveyor General
2. **July 14–19, 1858**: Hancock conducts field survey; completes field notes and plat
3. **July 1858**: Field notes sworn before notary public
4. **September 18, 1858**: U.S. Surveyor General J.W. Mandeville examines and approves field notes and plat
5. **December 14, 1867**: District Court appoints referees for rancho partition
6. **May 1868**: Courtney completes partition map based on Hancock survey
7. **March 6–11, 1869**: Plat published in *San Francisco Times* and *Los Angeles Republican*
8. **March–June 1869**: 90-day public inspection period — no protests documented
9. **November 23, 1872**: U.S. Surveyor General J.R. Hardenbergh certifies copy of plat
10. **December 9, 1873**: Commissioner of the General Land Office Willis Drummond approves plat
11. **1876**: U.S. Coast Survey T-Sheet No. 1432b prepared — this is the document on which modern restoration planning primarily relies

A.1.4 Administrative Acceptance and Regulatory Context

The Hancock plat, approved by the U.S. Surveyor General and published with extended public notice in two major newspapers, depicts the terminus as an "Inner Bay" with an "Obstructed Connection." No documented protest challenged this depiction during the 90-day inspection period (March–June 1869). There is no evidence in the record that any party challenged the "Inner Bay" / "Obstructed Connection" depiction, despite formal opportunity to do so.

The implication for the Revised EIR record is direct: if the Ballona terminus had been functioning as an open LA River mouth in 1858–1869, the official U.S. Government plat depicting it as an "Inner Bay" with "Obstructed Connection" would have attracted challenge from the many parties whose water rights and property interests depended on an accurate characterization. It did not.

A.2 Courtney Partition Map (May 1868)

For full analysis of the Courtney Partition Map, see Appendix C.

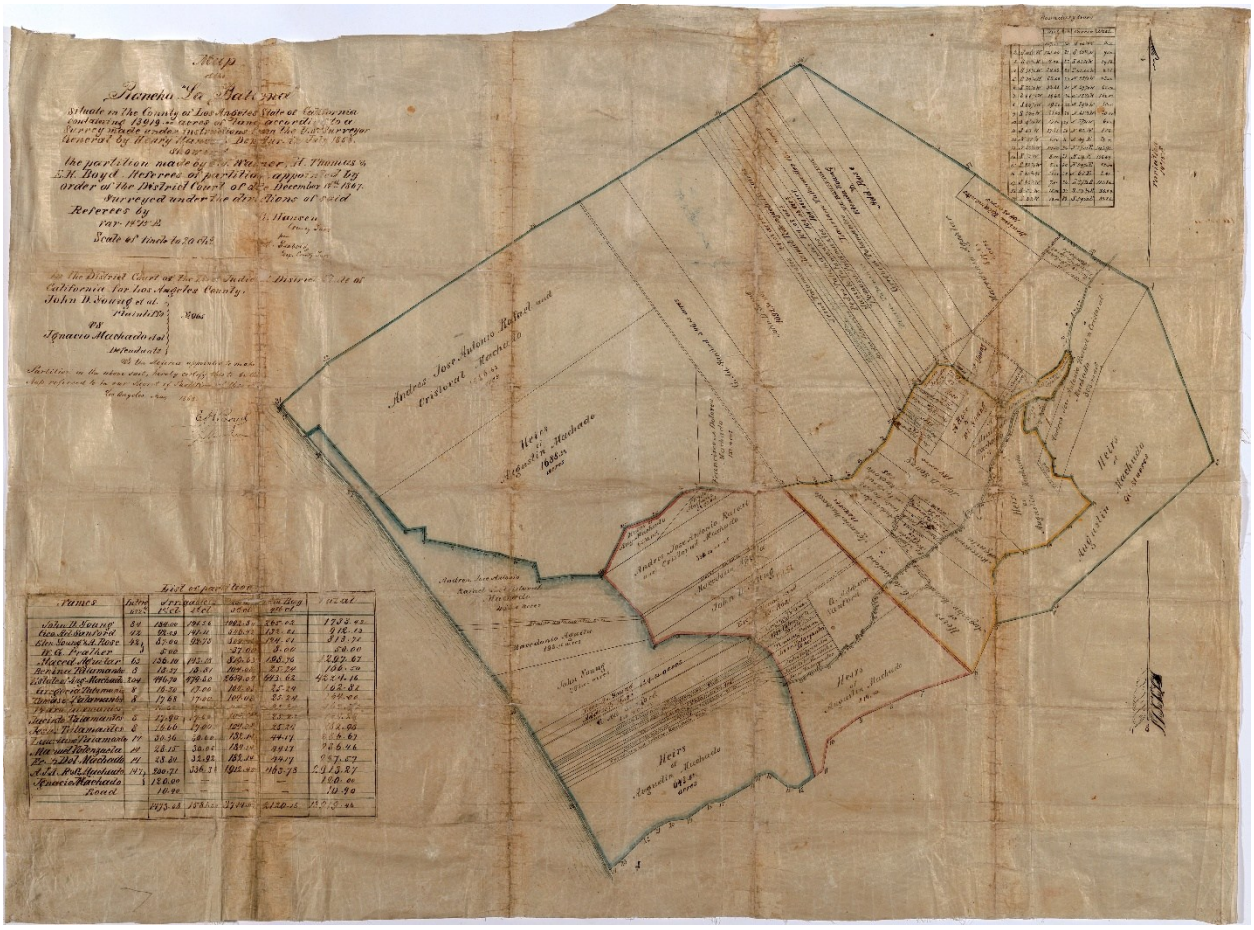


Figure A-3: Map of Rancho "La Ballona," District Court of the First Judicial District, State of California, Los Angeles County, Case No. 965 — John D. Young et al. v. Ignacio Machado et al. Partition made by Referees J.J. Warner, H. Thomas & E.H. Boyd, appointed by order of the District Court, December 14, 1867. Surveyed by G. Hansen, County Surveyor, per L. Seebold, Deputy County Surveyor. Scale: 1 inch to 20 chains. Magnetic variation: 14°15'E. Certified by the Referees, Los Angeles, May 1868. The embedded List of Partitions (lower left) classifies 2,120.16 acres as fourth-class "In Bay" land out of a total 13,919 acres — the court-certified land classification that is central to this report's evidentiary findings. [Archived by Tom McMahon, Playa del Rey, CA]

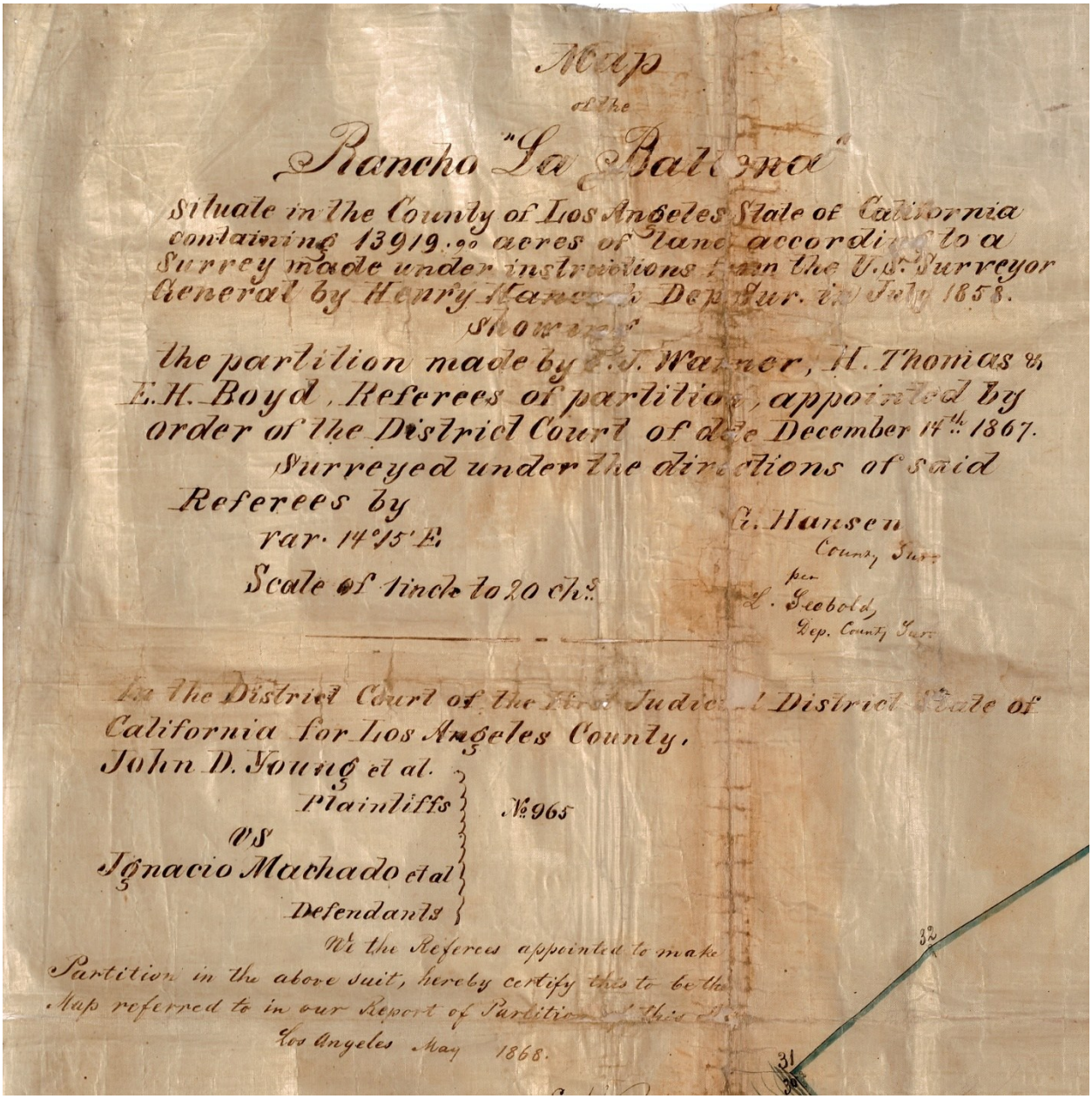
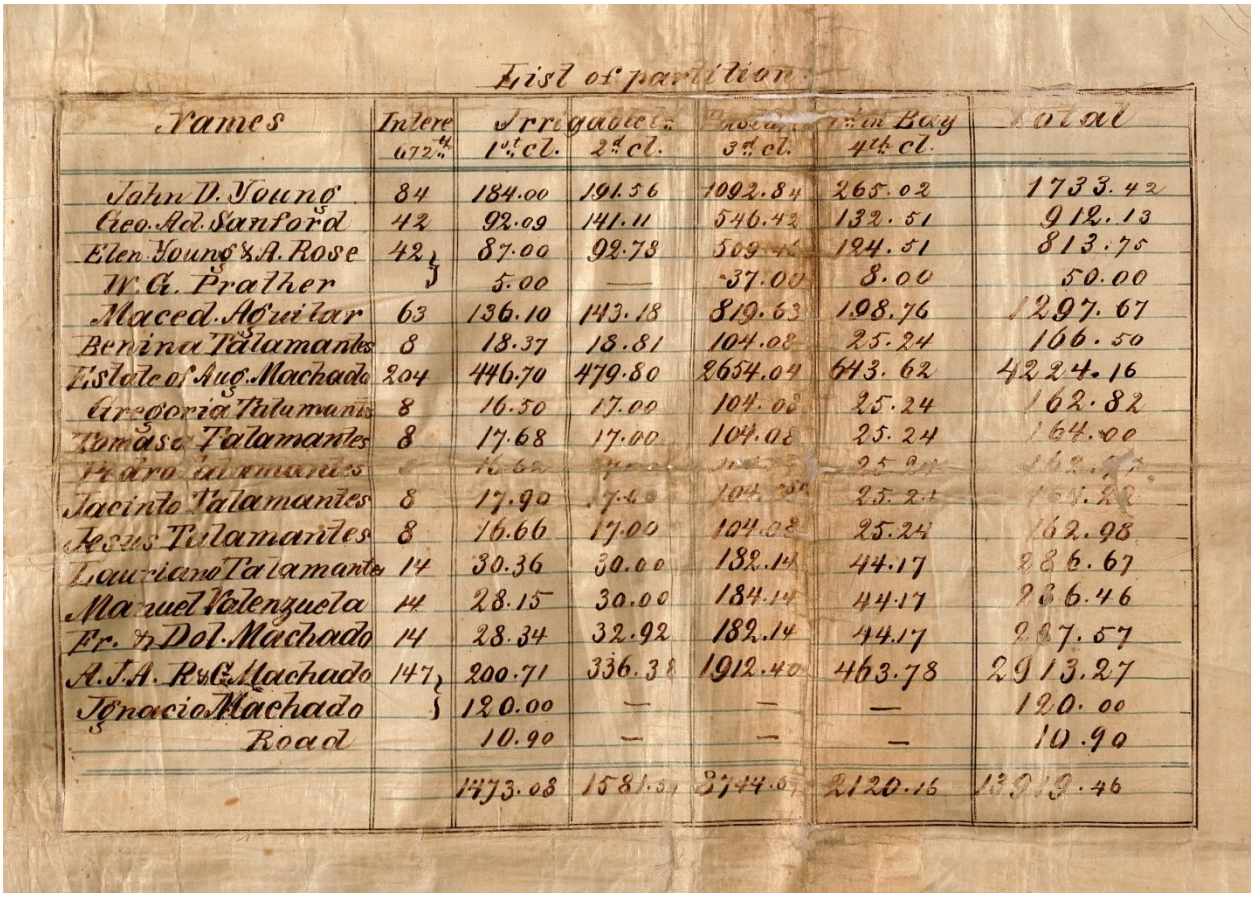

Map
of the
Rancho "La Ballona"
Situate in the County of Los Angeles State of California
containing 13919.90 acres of land according to a
Survey made under instructions from the U.S. Surveyor
General by Henry Hancock Dep. Sur. in July 1858.
Shewing
the partition made by J.J. Warner, H. Thomas &
E.H. Boyd, Referees of partition, appointed by
order of the District Court of the December 14th 1867.
Surveyed under the directions of said
Referees by
var. 14°15' E.
Scale of 1 inch to 20 chs.
G. Hansen
County Surv
per
L. Seebold
Dep. County Surv
In the District Court of the First Judicial District State of
California for Los Angeles County.
John D. Young et al.
Plaintiffs
No 965
vs
Ignacio Machado et al
Defendants
We the Referees appointed to make
Partition in the above suit, hereby certify this to be the
Map referred to in our Report of Partition of this D.
Los Angeles May 1868.
32
31

Figure A-4: Title block detail, Courtney Partition Map, Rancho "La Ballona," Case No. 965, District Court of the First Judicial District, Los Angeles County. Records: containing 13,919 acres per the Hancock survey of July 1858; partition by court-appointed Referees Warner, Thomas & Boyd; surveyed under Referee direction by G. Hansen, County Surveyor; certified by Referees, Los Angeles, May 1868. The explicit reference to Hancock's survey confirms the Courtney map is directly derived from and consistent with the 1858 federal survey. [Archived by Tom McMahon, Playa del Rey, CA]



List of partition

Names	Interest 672/4	Irrigable 1st cl.	2d cl.	Pasture 3d cl.	In Bay 4th cl.	Total
John D. Young	84	184.00	191.56	1092.84	265.02	1733.42
Geo. Ad. Sanford	42	92.09	141.11	546.42	132.51	912.13
Ellen Young & A. Rose	42½	87.00	92.78	509.44	124.51	813.75
W. G. Prather	⅓	5.00	—	37.00	8.00	50.00
Maced. Aguilar	63	136.10	143.18	819.63	198.76	1297.67
Benina Talamantes	8	18.37	18.81	104.08	25.24	166.50
Estate of Aug. Machado	204	446.70	479.80	2654.04	643.62	4224.16
Gregoria Talamantes	8	16.50	17.00	104.08	25.24	162.82
Tomas. Talamantes	8	17.68	17.00	104.08	25.24	164.00
Pedro Talamantes	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Jacinto Talamantes	8	17.90	17.00	104.08	25.24	164.22
Jesus Talamantes	8	16.66	17.00	104.08	25.24	162.98
Lauriano Talamantes	14	30.36	30.00	182.14	44.17	286.67
Manuel Valenzuela	14	28.15	30.00	184.14	44.17	286.46
Fr. & Dol. Machado	14	28.34	32.92	182.14	44.17	287.57
A. J. A. R. & G. Machado	147½	200.71	336.38	1912.40	463.78	2913.27
Ignacio Machado	⅓	120.00	—	—	—	120.00
Road		10.90	—	—	—	10.90
		1473.08	1581.[illegible]	8744.[illegible]	2120.16	13919.46

Figure A-5: List of Partitions, Rancho "La Ballona," Case No. 965, May 1868. Court-certified land classification of all 13,919 acres into four categories: first-class Irrigable (1,473.08 acres), second-class Pasture (1,581 acres), third-class Dry/Rough (3,744 acres), and fourth-class "In Bay" (2,120.16 acres). The fourth-class "In Bay" classification — applied to 2,120.16 acres of the total rancho — constitutes the court-certified documentary record of the spatial extent of tidal and bay-influenced lands as of the 1857–68 survey period. This classification is directly inconsistent with a full-tidal estuarine condition across the Ballona wetland complex and is central to the evidentiary findings of this report. [Archived by Tom McMahon, Playa del Rey, CA]

Appendix B: Hancock Field Notes — Key Excerpts

B.1 Title Page (Vol. 199, Page 298)

FIELD-NOTES
-of-
The final survey of the
RANCHO LA BALLONA
Agustin-Machado, et.al., Confirmee.

-By-
Henry Hancock, Deputy Surveyor.
Under his instructions of April 17, 1857.
Survey Commenced July 14, 1858.
Survey Completed July 19, 1858.

B.2 Survey Team and Authority (Vol. 199, Pages 299–300)

Henry Hancock's Oath (Page 299):

> "I, Henry Hancock, do solemnly swear that I will faithfully execute the final survey of the Rancho La Ballona, according to the instructions given me and to the best of my skill and ability."

Chain Bearers' Oath (Page 300):

> "We, John Warren and Benjamin Virgin, do solemnly swear that we will execute the duties of chain carriers; that we will level the chain upon uneven ground, and plumb the tally pins, whether by sticking or dropping the same; that we will report the true distance in all notable objects, and the true length of all lines that we may assist in measuring in the best of our skill and ability."

Survey Personnel:

- EBENEZER HADLEY — Compassman
- JOHN WARREN — Chairman
- BENJAMIN VIRGIN — Chairman
- Ramon Mendibil — Axeman

B.3 Ballona Creek Discharge Point (Vol. 199, Page 303)

Station 10 Field Notes:

> "To a point opposite the head of a bay on the southeast. Set stake for Station 10, 20 links east of bay and on west base of the hills. From this station the average bearing of **the northeast shore of the bay is about northwest and at about 100 chains the Ballona Creek discharges itself into the bay.**"

Analysis: Ballona Creek discharged into the "bay" (terminal lagoon) approximately 100 chains (6,600 feet / 1.25 miles) inland from the inlet, not directly to ocean.

B.4 Inlet Dimensions and Measurement (Vol. 199, Pages 305–306)

Station 23 — Inlet Crossing (Page 305):

> "Leave shore of bay and enter sand hills 8 and 10 chains wide extending far northwesterly. To east shore of inlet and drove stake for Station 23, from which **the east shore of inlet ranges about north 25 west, some 8 or 10 links wide for about 130 links.**"

Measurement Methodology (Page 306):

> "Thence:- **In order to ascertain the distance across the inlet I traversed and tabled for it, and found for course and distance.** S.45°09' W. 8.21 To Station 24 on west shore of inlet and drove stake and charred stake."

Analysis:

- Inlet width: 8–10 links = 5.3–6.6 feet
- Inlet length: 130 links = 85.8 feet
- Hancock deliberately measured the inlet, indicating it was a small, variable feature requiring special attention

B.5 Lagoon Extent (Vol. 199, Page 307)

Northernmost Extent of "Bay":

> "To a pile of rocks on the high rolling table land extending southeast a distance of about a mile and terminating in **low table land bordering on the Ballona Bay, which bay has its northmost terminus at a distance of about 130 chains.** Southeast of this point, set stake for Station 32."

Analysis: 130 chains = 8,580 feet = 1.625 miles (approximately 1.6 miles inland). This defines the maximum inland penetration of the tidal/lagoon influence—a limited coastal zone, not extensive estuarine penetration.

B.6 Ephemeral Water Bodies (Vol. 199, Page 308)

Dry Lake Bed Documentation:

> "To a point opposite and some 2.00 east of **a dry bed of a lake 10 chains from east to west and about 3, from north to south.**"

Analysis: The dry lake bed measured approximately 660 feet east-west by 198 feet north-south (10 chains × 66 feet/chain and 3 chains × 66 feet/chain respectively). Evidence of seasonal/ephemeral water bodies characteristic of terminal lagoon systems with evaporative concentration and seasonal flooding, not permanent estuarine conditions.

B.7 "Interior Lake" Statement (Vol. 199, Page 310 — REMARKS Section)

Hancock's Hydrological Assessment:

> "**The inlet bay may very properly be styled, an interior lake**, for as previously stated, in the foregoing notes, **the connection with the sea is often obstructed.**"

Context: This appears in the formal REMARKS section following 13 pages of detailed field measurements. This was Hancock's considered professional judgment after completing the entire survey, not a casual observation.

B.8 General Description of Rancho (Vol. 199, Page 311)

Soil and Land Character:

> "The northern portion of this Rancho consists of gently undulating land, affording good grazing and is well adapted to the growth of cereal crops.
>
> The southern portion is of a strong first rate soil and for the most part irrigable land."

Analysis: Interior lands were productive agricultural lands, consistent with Courtney Map classification of interior parcels as first-class (irrigable) and second-class (dry farming) rather than tidal/estuarine lands.

B.9 Boundary Dispute Context (Vol. 199, Page 310 — REMARKS Section)

Rancho Boundaries:

> "The land adjoining the line from Station 1 to Station 2 is claimed by both the claimants of the Rancho Rincon de los Bueyes and of the Rancho La Cienega Y Tijera all of whom agree to the lines as now run between them and the owners of La Ballona."

Boundary Testimony:

> "The owners of the Rancho Sousal Redondo were duly notified by the delivery of a written notice of Señor Don Juan Padilla, their agent, who protested against the lines as run from where the line between stations 4 and 5 cuts the small stream of water to the sea beach, but he introduces no testimony and from what I am able to learn after a thorough investigation of the transcripts of the proceedings, papers and evidence before the U.S. Land Commission in the cases of the two Ranchos La Ballona and Sousal Redondo, together with the papers and evidence on file in the office of the Clerk of the U.S. District Court for the Southern District of California, **there appears to me to be no foundation for a protest but on the contrary there is sufficient proof of the fact that in that portion of the boundary of the**

Rancho La Ballona the lines as run in this instance are as Señor Machado alleges, and also as proved by the declarations of Senores Don Manuel Dominguez and Basaldo Valdez, the former having been the Alcalde, who gave the judicial possession of the Rancho La Ballona and the latter one of his assistants."

Analysis: The boundary dispute focused on the "small stream of water to the sea beach"—not a major river outlet, but a small stream characteristic of terminal lagoon drainage.

B.10 Survey Verification (Vol. 199, Page 314)

U.S. Surveyor-General Certification:

"U.S. SURVEYOR-GENERAL'S OFFICE,
San Francisco, California.

I hereby certify that the foregoing transcript has been correctly copied from the original field-notes as the same appear of record and on file in this office.

In testimony whereof I have hereunto signed my name officially and caused my seal of office to be affixed this seventeenth day of February, 1863.

THEO. WAGNER,
U.S. Surveyor-General,
For California."

Appendix C: Courtney Partition Map (1867–1868)

C.1 Overview and Significance

The Courtney Partition Map (Los Angeles District Court Case No. 965, certified May 1868) is a court-ordered official document dividing Rancho La Ballona among its owners. Five features make it critical to historical baseline analysis:

1. **Official Authority**: Created under court order with fiduciary duty to accurately classify land values among competing claimants
2. **Explicit Hancock Citation**: Title block states the map is "according to a Survey made under instructions from the U.S. Surveyor General by Henry Hancock, Dep. Sur. in July, 1858"—establishing direct documentary continuity
3. **Four-Class Land System**: Quantifies the spatial extent of bay/tidal lands (fourth-class "Lands in Bay") versus productive agricultural lands (first and second class)

4. **Temporal Proximity**: Created only 43 years after the 1825 LA River avulsion; referees had living memory access to conditions
5. **Absence of River-Mouth Features**: If Ballona had been functioning as the LA River outlet for 42 years (1825–1867), one would expect different treatment of lands along a major river channel, recognition of estuarine land values, and explicit notation of river influence. None of these features appear on the Courtney Map.

C.2 Title Block Detail

[See Figure A-4 in Appendix A — this image is not repeated here. Insert the Courtney Title Block image once, in Appendix A only, captioned as Figure A-4.]

> ⚠ **Word Document Insertion Note:** When inserting images, place the Courtney Title Block detail image **only at Figure A-4 in Appendix A**. Do NOT insert a second copy here. This section refers the reader to Figure A-4.

Title Block Text (transcribed):

> Map
> of the
> Rancho "La Ballona"
> situate in the County of Los Angeles State of California
> containing 13919.97 acres of Land according to a
> Survey made under instructions from the U.S. Surveyor
> General by Henry Hancock, Dep. Sur. in July, 1858.
>
> Showing
> the partition made by J.J. Warner, H. Thomas &
> E.H. Boyd, Referees of partition, appointed by
> order of the District Court of date December 14th 1867.
> Surveyed under the directions of said
> Referees by G. Hansen
> (County Surveyor)
> var. 14°15'E.
> Scale of 1 inch to 20 chs.
>
> To the District Court of the First Judicial District State of
> California for Los Angeles County.
> John D. Young et al.
> Plaintiffs } No.965
> vs
> Ignacio Machado et al
> Defendants

Critical Documentary Chain:

1. **1857–1858**: Hancock surveys Rancho La Ballona under U.S. Government authority; field notes document "interior lake" with "often obstructed" connection to sea [1:Vol.199,p.310]; plat depicts "Inner Bay" and "Obstructed Connection" (July 1858)
2. **September 19, 1858**: U.S. Surveyor General J.W. Mandeville examines and approves both field notes and plat; files as official records
3. **1867**: Court appoints referees to partition the rancho (December 14, 1867); referees include J.J. Warner, one of the primary early California sources on LA River hydrology [3]
4. **1868**: Courtney completes partition map based on Hancock survey boundaries (May 1868); explicitly cites Hancock's July 1858 survey; fourth-class "Lands in Bay" limited to coastal fringe (consistent with "Inner Bay" on plat); interior lands classified as productive agricultural property
5. **March 1869**: Hancock plat published in *San Francisco Times* and *Los Angeles Republican*; four weeks of newspaper publication in each paper; 90-day public inspection period; no documented protests challenging "Inner Bay" or "Obstructed Connection" characterization
6. **November 23, 1872**: U.S. Surveyor General J.R. Hardenbergh certifies Hancock plat as "full true and correct Copy" of official record

This enhanced documentary sequence (1858 → 1858 approval → 1867 → 1868 → 1869 public notice → 1872 certification) provides multiple independent verifications over a 14-year period (1858–1872), federal authority at highest level (U.S. Surveyor General), public transparency through newspaper advertisement and inspection period, opportunity for contest by any interested parties (no protests documented), and documentary continuity from Hancock through Courtney to present day.

Yet modern restoration planning relies primarily on the 1876 T-Sheet and does not appear to analyze or cite this entire documentary foundation.

C.3 "List of Partitions" Table Detail

[See Figure A-5 in Appendix A — this image is not repeated here. Insert the List of Partitions image once, in Appendix A only, captioned as Figure A-5.]

> ⚠ **Word Document Insertion Note:** When inserting images, place the List of Partitions image **only at Figure A-5 in Appendix A**. Do NOT insert a second copy here. This section refers the reader to Figure A-5.

Table Structure:

Column	Class Description	Typical Value/Use
Names	Owner/Claimant	Individual property holders
Interest (acres)	Ownership fraction	Proportional share
Irrigable (1st cl.)	Prime irrigable farmland	High-value agricultural land near Ballona Creek
[2nd cl.]	Dry farming land	Non-irrigated but arable uplands
Swamp or in Bay (3rd cl.)	Pasture/marginal lands	Lower-value grazing areas
[4th cl.]	"Lands in Bay"	Tide-land and beach properties (lowest value)
Total	Total acreage	Sum of all classes

Key observations:

1. **Formal Quantification**: "Lands in Bay" is not a casual notation but a precisely measured and allocated land class with specific acreages assigned to each owner
2. **Economic Hierarchy**: The four-class system reflects clear economic valuation — first class (irrigable) highest value, fourth class (bay lands) lowest value
3. **Limited Fourth-Class Extent**: Inspection of individual owner allocations shows fourth-class "Lands in Bay" represents a small fraction of total rancho acreage, consistent with a narrow coastal fringe
4. **Official Significance**: This was not informal description but court-certified property partition with fiduciary duty to accurately classify and equitably distribute land values among competing claimants
5. **Consistency with Hancock**: The limited fourth-class extent is consistent with Hancock's documentation of lagoon terminus at ~130 chains (1.6 miles) inland [1:Vol.199,p.307], small inlet (5–6 feet wide) [1:Vol.199,p.305], "interior lake" characterization [1:Vol.199,p.310], and ephemeral water bodies in watershed [1:Vol.199,p.308]

Implication for Restoration Planning:

If current Areas A and B restoration footprint extends significantly beyond the fourth-class "Lands in Bay" extent shown on the Courtney Map, restoration planning is attempting to create conditions that the 1868 court-appointed referees—who had direct knowledge of the property and fiduciary duty to accurately classify it—did not recognize as "bay" or tidal lands. This represents a fundamental baseline error: restoring to conditions that never existed during the documented historical baseline (1857–68) established by Hancock and Courtney, as

documented by officially binding property classifications made only 43 years after the 1825 LA River avulsion.

C.4 Hancock–Courtney Integrated Analysis

Documentary Consistency (1858–1868):

Evidence Type	Hancock Survey (1858)	Courtney Map (1868)	Consistency Analysis
Authority	U.S. Government survey for federal land claims	Court-ordered partition (Case No. 965)	Both have highest official authority in their respective domains
Hydrologic Character	"Interior lake" with "often obstructed" inlet [1:Vol.199,p.310]	Fourth-class "Lands in Bay" limited to coastal fringe	Terminal lagoon, not open estuary
Tidal Extent	Lagoon terminus ~130 chains (1.6 mi) inland [1:Vol.199,p.307]	Low-value bay lands confined to immediate coast	Limited tidal penetration
Interior Lands	Good grazing, well-adapted to cereal crops [1:Vol.199,p.311]	First/second-class irrigable and dry farming lands	Productive agricultural character, not tidal
Inlet Character	5–6 feet wide, 86 feet long; requires special measurement [1:Vol.199,p.305]	Not shown as major feature on map	Small, variable feature—not major river outlet
Economic Assessment	Southern portion "strong first rate soil," "most part irrigable" [1:Vol.199,p.311]	Interior parcels allocated as high-value first/second class	Valuable agricultural lands, not marginal tidal lands
Ephemeral Features	Dry lake beds documented [1:Vol.199,p.308]	Third-class pasture lands in areas of seasonal wetness	Variable hydrology, not permanent tidal conditions
Creek Function	Ballona Creek discharges into	Creek channel shown terminating in coastal zone	Terminal lagoon system, not through-flowing river

Evidence Type	Hancock Survey (1858)	Courtney Map (1868)	Consistency Analysis
	lagoon ~1.25 mi from inlet [1:Vol.199,p.303]		

Critical Timeline:

- **1825**: LA River avulsion redirected flow away from Ballona (per documented historical record)
- **1858**: Hancock documents "interior lake" conditions (32–33 years post-avulsion)
- **1868**: Courtney partition shows limited "Lands in Bay" (43 years post-avulsion)
- **1876**: T-Sheet 1432b (51 years post-avulsion) ← This is what modern planning relies on

Question for Restoration Planning:

Why do modern plans rely primarily on the 1876 T-Sheet (51 years post-avulsion) while not appearing to analyze or cite the 1858 Hancock survey (approximately 32–33 years post-avulsion) and 1868 Courtney Map (43 years post-avulsion), both of which have superior evidentiary authority and earlier observation dates?

Answer Suggested by the Evidence:

The earlier documents describe conditions inconsistent with the "historical river mouth" narrative that underlies current restoration specifications.

C.5 Geographic Overlay Analysis (To Be Developed)

See Section 10.3 for the full geographic overlay analysis proposal.

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11. References

Hyperlink Verification Note: All hyperlinks in this report were verified live as of the report date; targets and availability may change without notice.

[1] Hancock, Henry. "Field Notes of the Final Survey of the Rancho La Ballona." Vol. 199, pp. 298–314. U.S. Government land survey for federal land claims process. Survey conducted under instructions from U.S. Surveyor General John G. Hayes (April 17, 1857). Field work: July 14–19, 1858. Sworn testimony before K.H. Dimmick, Notary Public (July 1858). Verified by Theo. Wagner, U.S. Surveyor-General for California (February 17, 1863). Key findings: Terminal lagoon characterized as "interior lake" with "often obstructed" connection to sea (p. 310); inlet dimensions 5–6 feet wide, 86 feet long (p. 305); lagoon extent ~1.6 miles inland (p. 307).

Original record held by U.S. Bureau of Land Management; obtained directly from BLM via email and physical DVD transmitted by a BLM official (2018). Also accessible via BLM General Land Office Records database (https://glorecords.blm.gov/search/default.aspx). Public-access digitized copy: https://archive.org/details/rancho-ballona-hancock-survey-obstructed-connection-with-the-sea-april-17-1857/Rancho%20Ballona%2C%20Hancock%20Survey%2C%20Obstructed%20Connection%20With%20The%20Sea%2C%20April%2017%2C%201857/ [Archived by Tom McMahon, Playa del Rey, CA]

[2] Hancock, Henry. "Plat of the Ballona Rancho." July 1858. Official map of Rancho La Ballona showing "Inner Bay" and "Obstructed Connection." Approved by U.S. Surveyor General J.W. Mandeville (September 19, 1858). Published in *San Francisco Times* (March 6, 1869) and *Los Angeles Republican* (March 11, 1869) for four weeks each. 90-day public inspection period with no documented protests. Certified by U.S. Surveyor General J.R. Hardenbergh (November 23, 1872). Original record held by U.S. Bureau of Land Management; obtained directly from BLM via email and physical DVD transmitted by a BLM official (2018). Also accessible via BLM General Land Office Records database (https://glorecords.blm.gov/search/default.aspx). Public-access digitized copy: https://archive.org/details/rancho-ballona-hancock-survey-obstructed-connection-with-the-sea-april-17-1857/Plat%20of%20the%20Ballona%20Rancho%2C%20Hancock%20Survey%2C%20July%201858/ [Archived by Tom McMahon, Playa del Rey, CA]

[3] Warner, J.J. "Historical Sketch of Los Angeles County." In Thompson & West, *History of Los Angeles County, California*. Oakland: Thompson & West, 1880. Warner testimony (1876) recorded by Judge Benjamin Hayes. Warner served as court-appointed referee for Courtney partition (1867). Available: https://www.ochistoryland.com/tw1880 (excerpts). Bibliographic reference: https://www.biblio.com/book/history-los-angeles-county-california-illustrations/d/1561252415 HathiTrust catalog record: https://catalog.hathitrust.org/Record/008619777

[4] Guinn, J.M. *A History of California and an Extended History of Los Angeles and Environs*. Los Angeles: Historic Record Company, 1915. Available: https://www.abebooks.com/History-California-Extended-Angeles-Environs-Complete/20088504222/bd (bibliographic listing). HathiTrust stable catalog record: https://catalog.hathitrust.org/Record/008653476 Guinn papers: https://www.huntington.org/collections/lib-mssguinn-papers-aspace-c11bb16cc54f6db4a7608471740bed05

[5] Dark, S., E.D. Stein, D. Bram, J. Osuna, J. Monteferante, T. Longcore, R. Grossinger, and E. Beller. 2011. *Historical ecology of the Ballona Creek watershed*. Southern California Coastal Water Research Project, Technical Report 671, Costa Mesa, California. Available: https://www.ballonahe.org/downloads/non_geo_data/ballona_report%5Bemail%5D.pdf Mirror: https://www.urbanwildlands.org/Resources/TR_671_Ballona%20Historical%20Ecology.pdf FTP (may deprecate):

https://ftp.sccwrp.org/pub/download/DOCUMENTS/TechnicalReports/671_BallonaHistoricalEcology.pdf

[6] Zedler, J.B. "Progress in wetland restoration ecology." *Trends in Ecology & Evolution* 15(10):402-407, 2000. Terminal lagoon hydrology principles applicable to Ballona. Available: https://pubmed.ncbi.nlm.nih.gov/10998517/

[7] Stein, E.D., et al. "Historical ecology and landscape change of the San Gabriel River and floodplain." Southern California Coastal Water Research Project Technical Report 499, 2007. Comparative analysis methods applicable to Ballona chronology. Referenced in Southern California historical wetlands atlas: https://www.sfei.org/sites/default/files/biblio_files/So_Cal_T-sheet_Atlas_lowres.pdf

[9] Los Angeles County Department of Public Works. *Hydrology Manual*. 2006. Watershed area data: Ballona Creek ~130 sq mi, LA River ~870 sq mi. Available: https://planning.lacity.gov/eir/CrossroadsHwd/deir/files/references/G12.pdf Mirror: https://cawaterlibrary.net/document/los-angeles-county-department-of-public-works-hydrology-manual/

[10] Courtney Map. "Map of the Rancho 'La Ballona'... Showing the partition made by J.J. Warner, H. Thomas & E.H. Boyd, Referees of partition." Los Angeles District Court Case No. 965, certified May 1868. Shows four-class land system with fourth-class "Lands in Bay" limited to coastal fringe. Based explicitly on Hancock's July 1858 survey. Physical case file held in: Los Angeles Area Court Records (LAACR), The Huntington Library, San Marino, CA 91108 — a collection of 1850–1910 court case files placed on long-term deposit by the Los Angeles Superior Court beginning in 1996. Note: The Huntington also holds a separate "Richard Courtney papers" collection, gifted in 1983 by a former Superior Court archives employee; this is a distinct collection from the LAACR and from the 1868 partition map, though Huntington staff cross-reference both in the LAACR finding aid. Access to the physical case file: Reader Services, 626-405-2191, reference@huntington.org, appointment required. LAACR finding aid: https://oac.cdlib.org/findaid/ark:/13030/c8n58stf/ LAACR research guide: https://researchguides.huntington.org/laacr Huntington digital object (map image): https://hdl.huntington.org/digital/collection/p15150coll4/id/11328/ (Huntington Library digital object, institutional repository). Public-access mirror: https://archive.org/details/rancho-la-ballona-los-angeles-court-records-00965-courtney-map [Archived by Tom McMahon, Playa del Rey, CA]

[13] U.S. Coast Survey. T-Sheet No. 1432b, 1876. "Ballona Lagoon" depicted with "Swamps" notation. Often cited in modern restoration planning despite being 18 years later than Hancock survey and lacking sworn testimony or federal land survey authority. Referenced in Southern California T-Sheet Atlas: https://www.sfei.org/sites/default/files/biblio_files/So_Cal_T-sheet_Atlas_lowres.pdf Also described in Dark et al (2011): https://www.ballonahe.org/downloads/non_geo_data/ballona_report%5Bemail%5D.pdf

[14] California Department of Fish and Wildlife. *Ballona Wetlands Restoration Project Final Environmental Impact Report*. 2020. [DECERTIFIED September 2023 following May 2023 Los Angeles County Superior Court ruling regarding inadequate disclosure and analysis of flood control parameters]. Modern planning document that relied on T-Sheet 1432b while omitting Hancock field notes, Hancock plat, and Courtney partition map documentation of terminal lagoon conditions. Used inadequate flood capacity specifications (46,000 cfs) below the 68,000 cfs Standard Project Flood established in the 1979 USACE hydrologic analysis [22:passim]. CDFW preparing Revised EIR as of February 2026. Available: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=175290&inline Mirror: https://scc.ca.gov/webmaster/ftp/pdf/sccbb/2021/2105/20210527Board05_Ballona_Wetlands_Ex7.pdf Mirror: https://wetlandsrestoration.org/final-eir/

[15] State Coastal Conservancy. Ballona Wetlands Ecological Reserve Restoration Project. Program planning documents and technical reports. Available: https://scc.ca.gov/projects/ballona-wetlands Pattern of relying on later T-Sheet while not appearing to analyze or cite earlier Hancock and Courtney government records with superior evidentiary authority and earlier documentation dates.

[16] McMahon, Tom. "The Los Angeles River Flowed South To Dominguez Carson And San Pedro Prior To 1815." Internet Archive, February 14, 2026. CC0 1.0 Universal. Documents and evaluates seven independent evidence categories (Spanish expedition accounts, Spanish colonial land grants, documented flood chronology, geological and geomorphic studies, sedimentological surveys, cartographic records, and indigenous settlement patterns) demonstrating that the southward Dominguez–San Pedro corridor was the LA River's long-term Holocene ancestral pathway. Key conclusion: the 1825 flood restored rather than created the southward route; the 1815–1825 westward avulsion toward Ballona was the anomalous condition. Includes critical counterargument analysis addressing the five most plausible objections (Section X.F). Available: https://archive.org/details/the-los-angeles-river-flowed-south-to-dominguez-carson-and-san-pedro-prior-to-1815 PDF: https://archive.org/download/the-los-angeles-river-flowed-south-to-dominguez-carson-and-san-pedro-prior-to-1815/The_Los_Angeles_River_Flowed_South_to_Dominguez_Carson_and_San_Pedro_Prior_to_1815.pdf [Archived by Tom McMahon, Playa del Rey, CA]

[17] McMahon, Tom. "Freshwater Springs Of The Ballona Watershed, Historical & Contemporary Analysis." Internet Archive, January 31, 2026. CC0 1.0 Universal. Documents 45 freshwater springs mapped in the Ballona Watershed (1850–1890), with 70% concentrated in the Santa Monica Mountain foothills. Historical combined discharge estimated at 2–5 million gallons/day (conservative estimate) based on Hall 1888 survey [23] and documented spring flows, including Centinela Springs (269,000–404,000 gal/day natural; developed to 900,000 gal/day capacity by 1890). Current discharge approximately 50,000–75,000 gallons/day—a 96–98% reduction. Kuruvungna Springs at University High School (22,000–25,000 gal/day as of 2026) remains the watershed's most productive active spring. The spring system sustained the Ballona wetland complex independently of LA River flows after 1825. Available: https://archive.org/details/freshwater-springs-of-the-ballona-watershed-historical-contemporary-

analysis-perplexity PDF: https://archive.org/download/freshwater-springs-of-the-ballona-watershed-historical-contemporary-analysis-perplexity/Freshwater%20Springs%20of%20the%20Ballona%20Watershed%2C%20Historical%20%26%20Contemporary%20Analysis%2C%20Perplexity.pdf [Archived by Tom McMahon, Playa del Rey, CA]

[18] McMahon, Tom. "Ballona Watershed Springs, Hydrology & Flow Rates." Internet Archive, January 31, 2026. CC0 1.0 Universal. Companion analysis to [17] documenting natural freshwater springs of the Ballona Watershed with hydrological flow rate analysis. Estimated historical combined discharge from major documented springs: 3.5–7.5 million gallons/day (upper-bound analysis; conservative estimate 2–5 MGD per [17]). Current spring-fed contribution: approximately 25,000–56,000 gallons/day—a reduction exceeding 98% (upper-bound analysis; conservative estimate 96–98% per [17]). 2011 SCCWRP hydrological study confirmed only ~2% of Ballona Creek's current flow originates from natural springs; 98% is urban runoff. Tongva archaeological evidence documents 8,000–10,000 years of spring-supported settlement. Available: https://archive.org/details/ballona-watershed-springs-hydrology-flow-rates-claude PDF: https://archive.org/download/ballona-watershed-springs-hydrology-flow-rates-claude/Ballona%20Watershed%20Springs%2C%20Hydrology%20%26%20Flow%20Rates%2C%20Claude.pdf [Archived by Tom McMahon, Playa del Rey, CA]

[19] McMahon, Tom. "Ballona Wetlands Historical Baseline And Truth Maintenance Analysis." Internet Archive, February 15–16, 2026. CC0 1.0 Universal. Evaluates the internal logical consistency of historical claims used to justify the Ballona Wetlands Restoration Project. Documents a truth maintenance failure in which mutually incompatible claims about historical conditions are carried forward simultaneously without reconciliation. Key finding: CDFW's selected baseline period (1850–1890) begins 25–65 years after the most significant natural hydrological change in the LA coastal plain (the 1815–1825 LA River avulsion), meaning the baseline period itself represents fundamentally altered, post-disturbance conditions rather than pre-disturbance hydrology. Report explicitly does not advocate for or against any specific restoration alternative; it evaluates logical consistency only. Available: https://archive.org/details/ballona-wetlands-historical-baseline-and-truth-maintenance-analysis-ia PDF: https://archive.org/download/ballona-wetlands-historical-baseline-and-truth-maintenance-analysis-ia/Ballona-Wetlands-Historical-Baseline-and-Truth-Maintenance-Analysis-IA.pdf [Archived by Tom McMahon, Playa del Rey, CA]

[20] Altschul, Jeffrey H., and Donn R. Grenda, eds. "Life at the Nexus of the Wetlands and Coastal Prairie, West Los Angeles." *Proceedings of the Society for California Archaeology*, Vol. 20, pp. 34–42. 2007. Presents Holocene-scale paleoenvironmental reconstruction of the Ballona region based on archaeological settlement patterns, sediment cores, and offshore fan-delta morphology. Documents 8,000 years of environmental change including episodic LA River capture of Ballona drainage. Central geomorphic claim: "during much of the Holocene, Ballona Creek captured the flow of the much larger Los Angeles River, as evidenced by a massive submarine fan-delta off the coast." Documents progressive Holocene sedimentation and

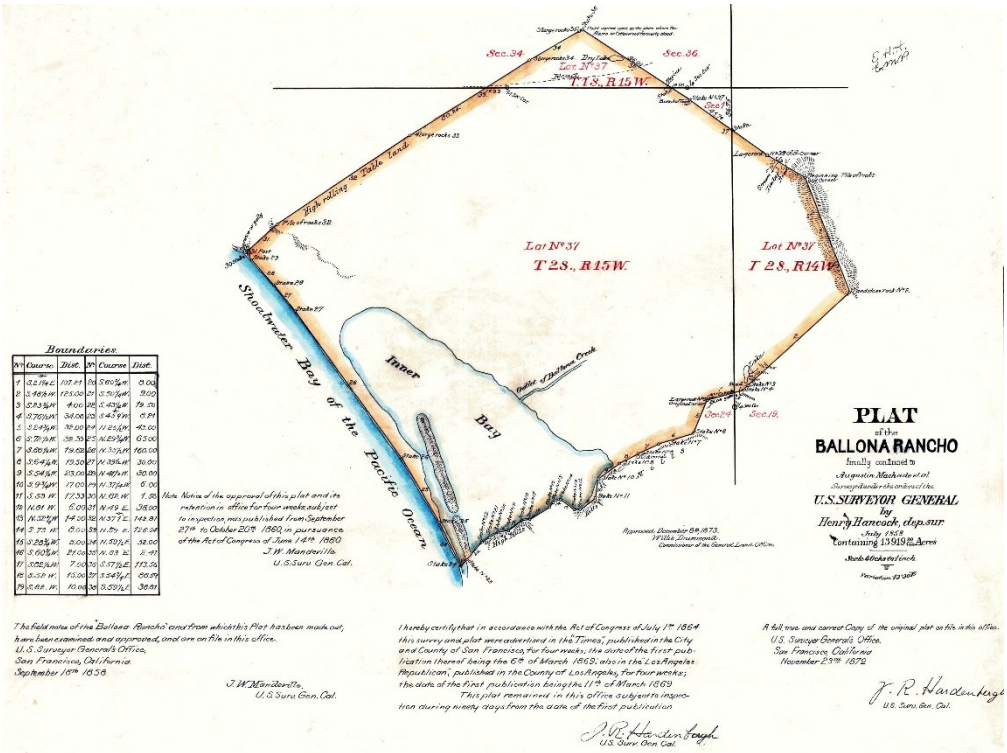
transition from open embayment to "sediment-choked estuary" by 1000 BP (pp. 36–40) — trajectory consistent with Hancock's 1857–58 "interior lake" documentation. Temporal scope (Holocene, 8000–200 BP) does not address 19th-century channel configuration or the restoration planning baseline period; authors do not claim otherwise.

[21] Gumprecht, Blake. *The Los Angeles River: Its Life, Death, and Possible Rebirth*. Baltimore: Johns Hopkins University Press, 1999. Winner, J.B. Jackson Prize, Association of American Geographers. Peer-reviewed academic monograph providing the foundational historical hydrology and geomorphic analysis of the LA River. Documents the river's pre-1825 southward drainage pattern through the Dominguez corridor to San Pedro Bay as the baseline condition from which the 1815–1825 westward avulsion toward Ballona was the anomalous departure. Chapter 1 establishes the historical hydrologic framework; documents the river flowing "directly south to San Pedro Bay" past the Dominguez Hills in its dominant configuration, with floodwaters backing along the south and west sides of Dominguez Hills in the Dominguez Slough. ISBN 978-0-8018-6047-8. Available: https://archive.org/details/losangelesriveri0000gump Publisher: https://www.press.jhu.edu/books/title/2709/los-angeles-river

[22] U.S. Army Corps of Engineers, Los Angeles District. *Ballona Creek — Channel and Sawtelle-Westwood Channel Hydrology Feasibility Report*. February 1979. Establishes 68,000 cfs as the Standard Project Flood (SPF) design discharge for Ballona Creek. Also documents approximately 72,000 cfs channel conveyance capacity upstream of the Lincoln Boulevard Bridge — a distinct engineering quantity representing the physical hydraulic capacity of that specific upstream channel reach, not a competing design flood standard. The original EIR's use of 46,000 cfs was below the adopted SPF standard. This report is the authoritative USACE hydrologic source for flood capacity specifications cited throughout this document. Original archived on Internet Archive by Tom McMahon, Playa del Rey, CA. Available: https://archive.org/details/standard-project-flood-peak-discharges-future-conditions-restricted-flow-plate-28-1979-report/Ballona%20Creek%20-%20Channel%20and%20Sawtelle-Westwood%20Channel%20Hydrology%20Feasibility%20Report%20021979/ Access verified February 2026.

[23] Hall, William Hammond, and California Department of Engineering. *California State Engineering Department. Detail Irrigation Map(s), Los Angeles and San Bernardino Counties, California. To Accompany Report on Irrigation and Water Supply*. George Sandow, draughtsman. California Department of Engineering, 1888. One of a series of twelve sheets. Scale 1:42,240; 53 × 70 cm. Primary cartographic source for historical spring locations and relative discharge in the Ballona watershed, as compiled and analyzed in References [17] and [18]. Note: David Rumsey Map Collection catalog record for this item displays "1988" in some views — this is a data entry error; the correct date is 1888, confirmed by the map's own title block ("Wm. Ham. Hall, State Engineer, 1888") and all independent bibliographic references. Available: David Rumsey Map Collection (institutional repository): https://www.davidrumsey.com/luna/servlet/detail/RUMSEY~8~1~207654~3003409:Composite--Detail-Irrigation-Map%2C-L Access verified February 2026.

[24] Reagan, J. F. *Early Floods in Los Angeles County*. Los Angeles County Flood Control District, 1917. Prepared by J. F. Reagan, County Flood Control Engineer. Primary-source compilation documenting major flood events from 1811 through the early 20th century, drawn from interviews, correspondence, court records, well logs, rainfall notes, and contemporary newspapers (*Los Angeles News*, *Los Angeles Star*). Documents the 1815 flood as the event that "materially changed the course of the Los Angeles River within the Pueblo limits" and caused the river to abandon its former channel westward toward Ballona (p. 11). Documents the 1825 flood as the event that restored the eastward/southward course: "The river flowed out through the Ballona Creek before this flood, but after this time it passed near the foot of the hills at Dominguez, and into San Pedro Bay" (p. 80). Multiple independent eyewitness testimonies compiled from named witnesses confirm the pre-1825 Ballona outlet and post-1825 Dominguez/San Pedro course (pp. 11, 45, 80, 85, 97, 240). Includes testimony collected for Santa Fe Railroad legal proceedings from witnesses with living memory of pre-1825 conditions, including witnesses aged 93 and 137 at time of interview (p. 85). Directly corroborates Section 4.4 flood chronology and Section 1.3 hydrologic periods framework. Archived on Internet Archive by Tom McMahon, Playa del Rey, CA. Available: https://archive.org/details/early-floods-in-los-angeles-county-j.-f.-reagan-1917 PDF: https://archive.org/download/early-floods-in-los-angeles-county-j.-f.-reagan-1917/Early%20Floods%20in%20Los%20Angeles%20County%2C%20J.%20F.%20Reagan%201917.pdf Access verified February 2026.


Sec. 34
Sec. 36
T 1 S., R 15 W.
Lot N° 37
T 2 S., R 15 W.
Lot N° 37
T 2 S., R 14 W.
Shoalwater Bay of the Pacific Ocean.
Inner Bay
Outlet of Ballona Creek
PLAT
of the
BALLONA RANCHO
finally confirmed to
Augustin Machado et al
Surveyed under the orders of the
U.S. SURVEYOR GENERAL
by
Henry Hancock, dep. sur.
July 1858
containing 13919 acres
Boundaries.
Note. Notice of the approval of this plat and its retention in office for four weeks subject to inspection was published from September 27th to October 20th 1860, in pursuance of the Act of Congress of June 14th 1860
J. W. Mandeville
U.S. Surv. Gen. Cal.
Surveyed December 9th 1873.
William Drummond
Deputy U.S. Surveyor
Commissioner of the General Land Office.
The field notes of the "Ballona Rancho" and from which this Plat has been made out, have been examined and approved, and are on file in this office.
U.S. Surveyor General's Office,
San Francisco, California
September 18th 1858.
J. W. Mandeville
U.S. Surv. Gen. Cal.
I hereby certify that in accordance with the Act of Congress of July 1st 1864 this survey and plat were advertised in the "Times", published in the City and County of San Francisco, for four weeks, the date of the first publication thereof being the 6th of March 1869, also in the Los Angeles "Republican", published in the County of Los Angeles, for four weeks; the date of the first publication being the 11th of March 1869
This plat remained in this office subject to inspection during ninety days from the date of the first publication
J. R. Hardenbergh
U.S. Surv. Gen. Cal.
A full, true, and correct Copy of the original plat on file in this office.
U.S. Surveyor General's Office,
San Francisco, California
November 25th 1872
J. R. Hardenbergh
U.S. Surv. Gen. Cal.